

# *Geopolitics of Minerals*

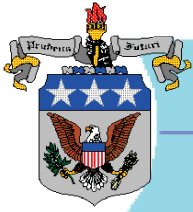
Center for Strategic Leadership **CSL**

# *The Geopolitics of Strategic Minerals*



**Dr. Kent H. Butts**  
Center for Strategic Leadership  
U.S. Army War College  
20 October 2009





# *Minerals and Security*

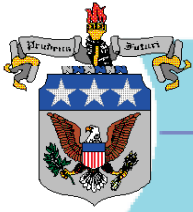
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## Geopolitics:

**“The relation of international political power to the geographic setting.”**

*Saul B. Cohen*



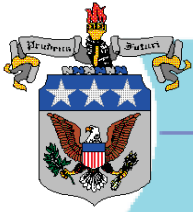


# Minerals Policy

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- ✦ Roman access Cornwall – Tin, Bronze Weapons
- ✦ New World resources - Colonial empires
- ✦ Bernard Baruch/Charles Leith – WW I
- ✦ Paley Commission Report of 1952
- ✦ Soviet cut-off of manganese & chromium
- ✦ Oil embargo (OPEC) of 1973-74
- ✦ 1978 invasion of Zaire's Shaba Province
- ✦ National Defense Stockpile
- ✦ Market dependence – enhance supply





# *STATE BEHAVIOR*

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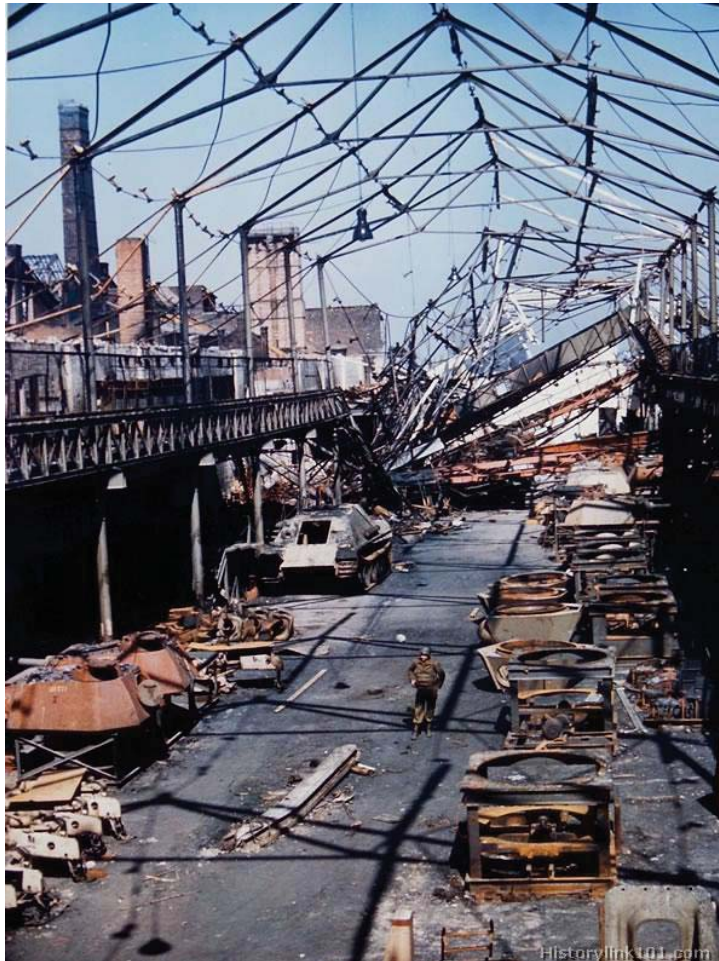
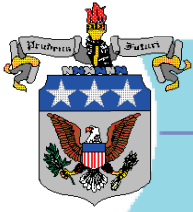
# CSL

✚ **No great nation willingly allows its standard of life and culture to be lowered and no great power accepts the risk that it will go hungry**

*Hjalmar Schacht,*

*German Minister of Economics, 1937*

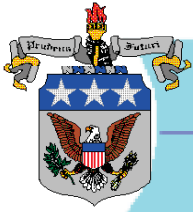




**“The consumption  
of our latest reserves of  
chromium ore (Turkish)  
would have ended the  
war by January 1, 1946  
at the very latest.”**

*Albert Speer*





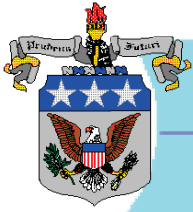
# *Minerals and Security*

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**“Our aim is to gain control of the two great treasure houses on which the West depends. The energy treasure house of the Persian Gulf and the mineral treasure house of Central and Southern Africa.”**

*Leonid Brezhnev, Prague 1973*

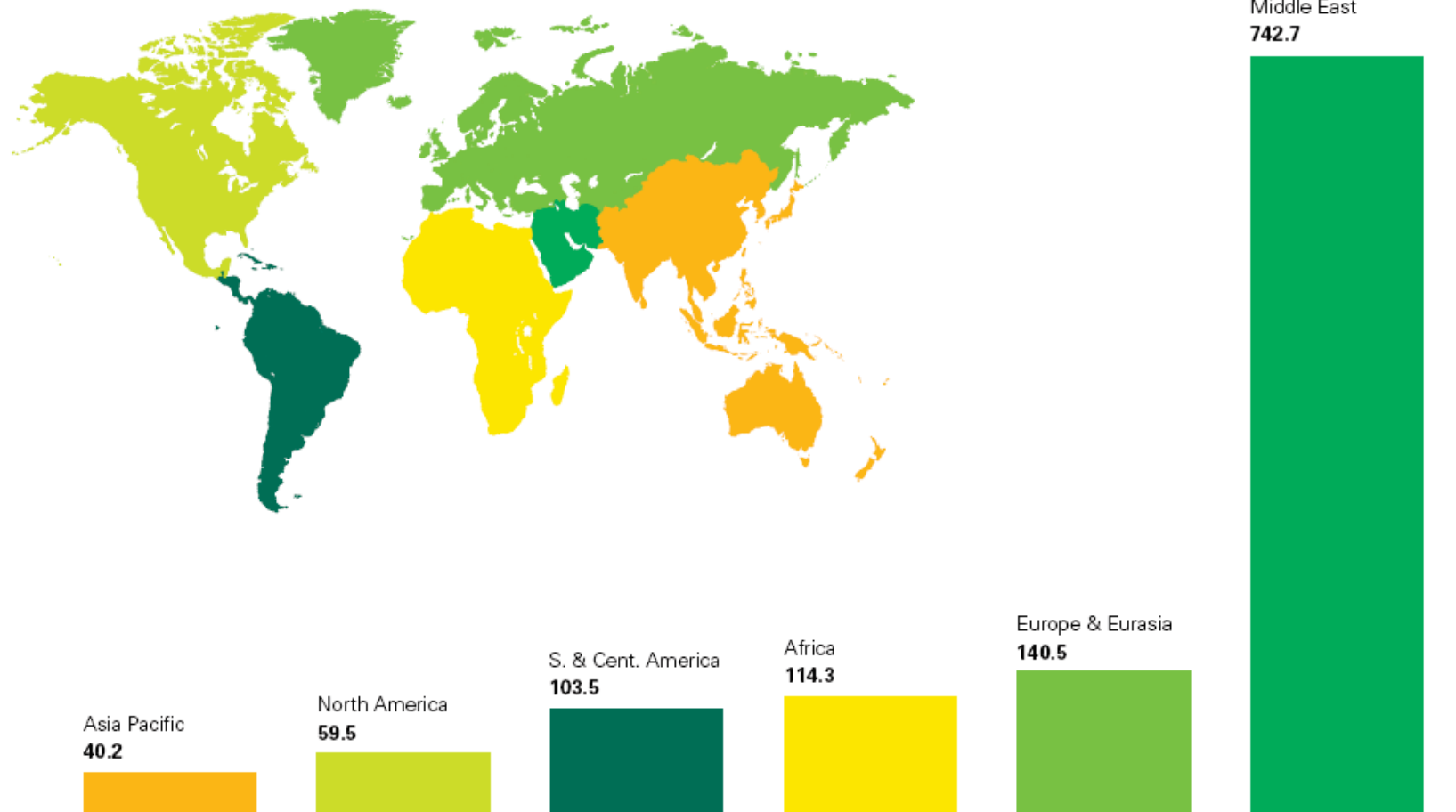




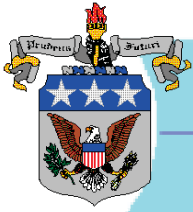
# Proved Oil Reserves

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Proved reserves at end 2005  
Thousand million barrels



Source: BP Statistical Review of World Energy 2006



# *Strategic Minerals of Southern Africa*

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**DRC/ZAIRE**  
**COBALT**  
**COLTAN**

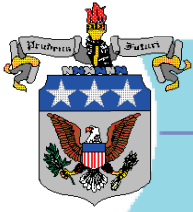


  
**ZAMBIA**  
**COBALT**

  
**ZIMBABWE**  
**CHROMIUM**

  
**SOUTH AFRICA**  
**MANGANESE**  
**CHROMIUM**  
**PLATINUM**





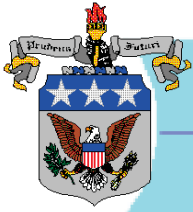
# *U. S. Consumption*

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✚ **In almost every metal or mineral-fuel category, American consumption since the outbreak of WWI had exceeded the entire quantity of that material used anywhere in the world since the beginning of time.**

– The President's Materials Policy Commission, 1951



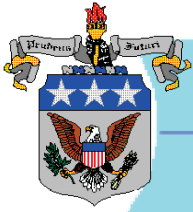


# ***US MINERALS POSITION***

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- ❖ **The US imports approximately 60% of its petroleum consumption.**
- ❖ **The US imports over 80 % of its most important strategic minerals:  
Chromium/PGM/Manganese/Cobalt/ Rare Earth Elements.**
- ❖ **Forty four percent of the 18 minerals on which the US is 100% import dependent are produced in China.**



# Minerals in Pratt & Whitney F100 Turbofan Engine

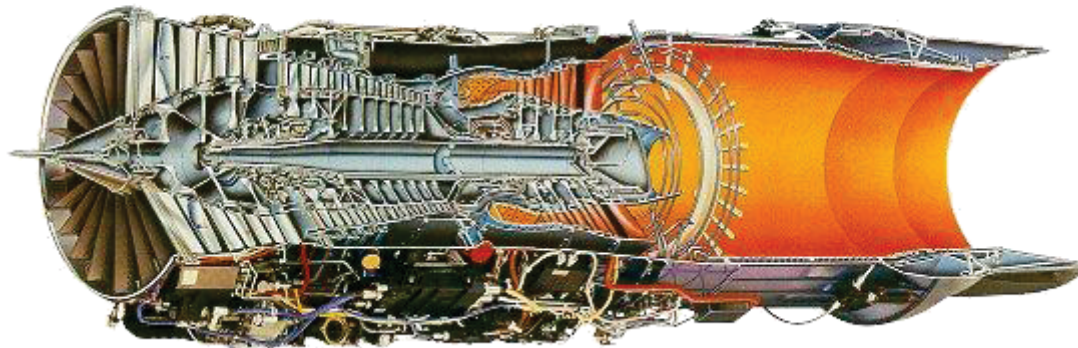
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**Nickel**  
4,504 Lbs.

**Titanium**  
5,440 Lbs.

**Chromium**  
1,485 Lbs

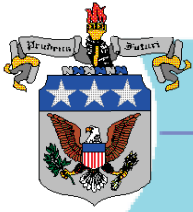
F100-PW-229 TURBOFAN ENGINE



**Columbium**  
145 Lbs.

**Manganese**  
23 Lbs.

**Cobalt**  
885 Lbs

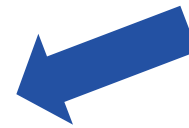


# *Rare Earth Elements (REE) in a Prius Engine and Battery*

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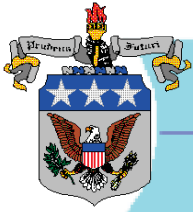
*Neodymium  
2.2 Lbs.*



*Lanthanum  
22-33 Lbs.*



*Toyota projects U.S. sales of 100,000 in 2009, 180,000 in 2010,  
and world-wide sales totaling 1,000,000 cars (2010)*



# Demographics

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**Depending on the place -- growing, static, or aging**

2000 to 2025

*Total population in millions*

**China:** 1,262.5 to 1,453.1

**India:** 1,002.7 to 1,396.0

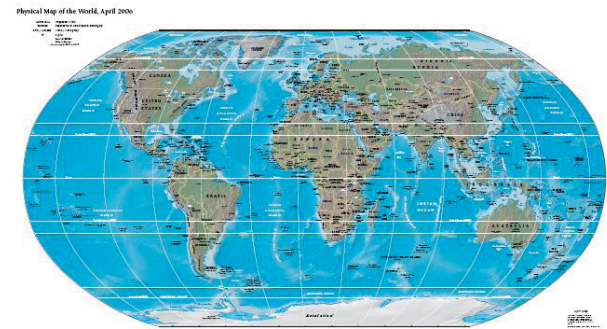
**Pakistan:** 141.6 to 217.9

**Indonesia:** 224.1 to 278.5

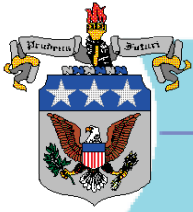
**Japan:** 126.7 to 117.8

**South Korea:** 47.3 to 49.37

**Russia:** 146 to 128.1





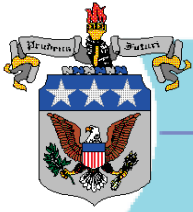


# *China*

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- **Second largest GDP**
- **World's largest military**
- **Nuclear weapons**
- **Changing rapidly**
- **Seeks regional/global leadership role**
- **Mineral import dependent**





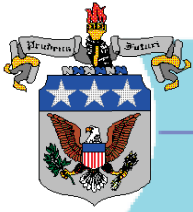
# China

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- **Economic growth critical to social stability & CCP survival**
- **Rising unemployment/urban-rural gap,**



A Chinese boy tows a floating plastic bag of stolen natural gas near the central Chinese town of Pucheng.



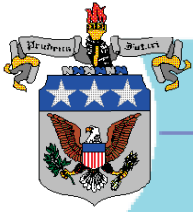
# *China's Mineral Dilemma*

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- **Only 21 of the 45 minerals with proven reserves in China will meet its domestic demand by 2010.**
- **By 2020, the figure will fall to only six minerals.**

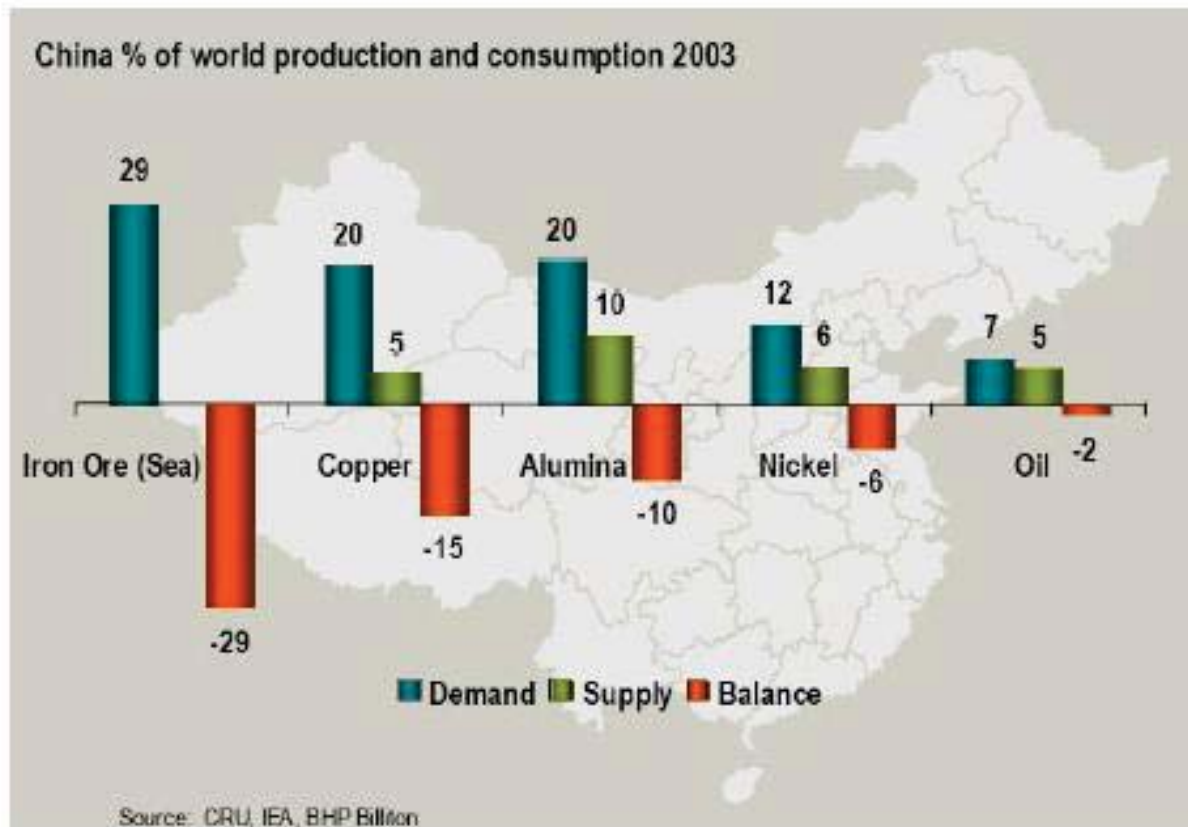


[http://www.domain-b.com/economy/world/economy/20090406\\_ambassador\\_defends.html](http://www.domain-b.com/economy/world/economy/20090406_ambassador_defends.html)

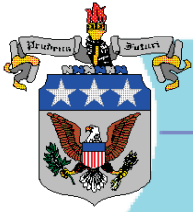


# China's Demand Exceeds Domestic Resource Supply

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[http://www.minerals.org.au/\\_data/assets/pdf\\_file/0009/9981/MCA\\_China\\_Economic\\_and\\_TradeCoopForum\\_MHH230505.pdf](http://www.minerals.org.au/_data/assets/pdf_file/0009/9981/MCA_China_Economic_and_TradeCoopForum_MHH230505.pdf)



# *Impact*

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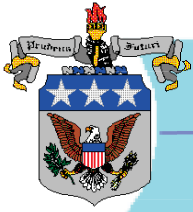
## ❖ **CHINA PURCHASED:**

- ❖ **8.9 Percent World's Oil (2007)**
- ❖ **32 Percent World's Aluminum and Steel (2007)**
- ❖ **47 Percent of World's Iron Ore (2007)**
- ❖ **54 Percent of World's Cement (2008)**

## ❖ **CHINA DRIVEN PRICE INCREASES (01-08)**

- ❖ **Copper 547 Percent**
- ❖ **Iron Ore 455 Percent**
- ❖ **Aluminum 200 Percent**





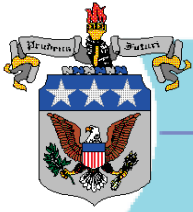
# *China's Mineral Demand*

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- ⊕ **Accounted for 75% of the 175 MT increase in steel consumption between 1995-2003**
- ⊕ **Consumption will be 310 MT in 2010**
- ⊕ **By 2010 must import:**
  - ▣ **57% iron ore**
  - ▣ **70% copper concentrates**
  - ▣ **80% alumina**







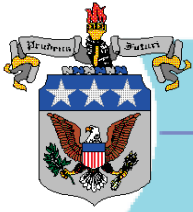
# *U.S. Seen as Threat*

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- ❖ **World hegemony - theory**
- ❖ **US Alliance to “Contain China” – Japan, India, Taiwan, Viet Nam, Thailand, Central Asia, South Korea**
- ❖ **DoD budget: \$ 553 B**
- ❖ **PLA budget \$ 70 B**





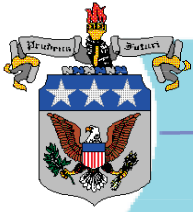


# *U.S. Seen as Threat*

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- ❖ **Sec Rumsfeld's— China as threat**
- ❖ **P3 and South China Sea Incidents**
- ❖ **U.S. controls economic &  
political institutions**
- ❖ **Dep. Sec. Def. to World Bank**
- ❖ **Belgrade Embassy Bombing**



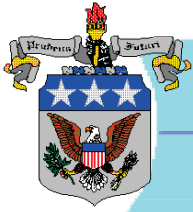


# *China Mineral Diplomacy* **CSL**

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- ⊕ **Driven by economy & import dependence**
- ⊕ **Do not trust market or U.S. influence**
- ⊕ **Go Out Strategy-**control source** -UNOCAL**
- ⊕ **Pay high price**
- ⊕ **Unencumbered by principles**
- ⊕ **Isolate Taiwan**
- ⊕ **Backed by \$ resources**

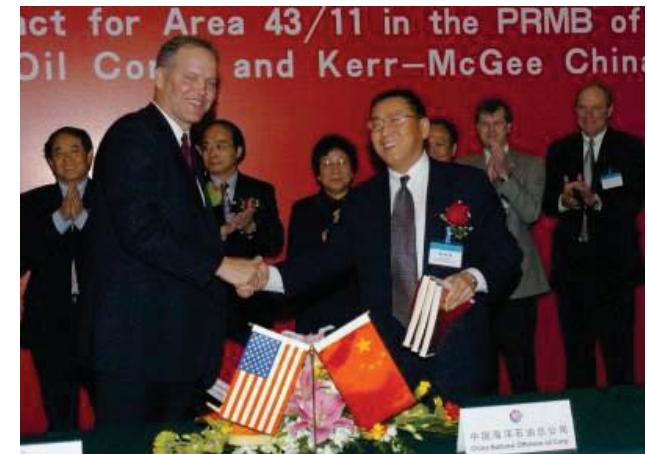




# *Industrial Policy – Teamwork*

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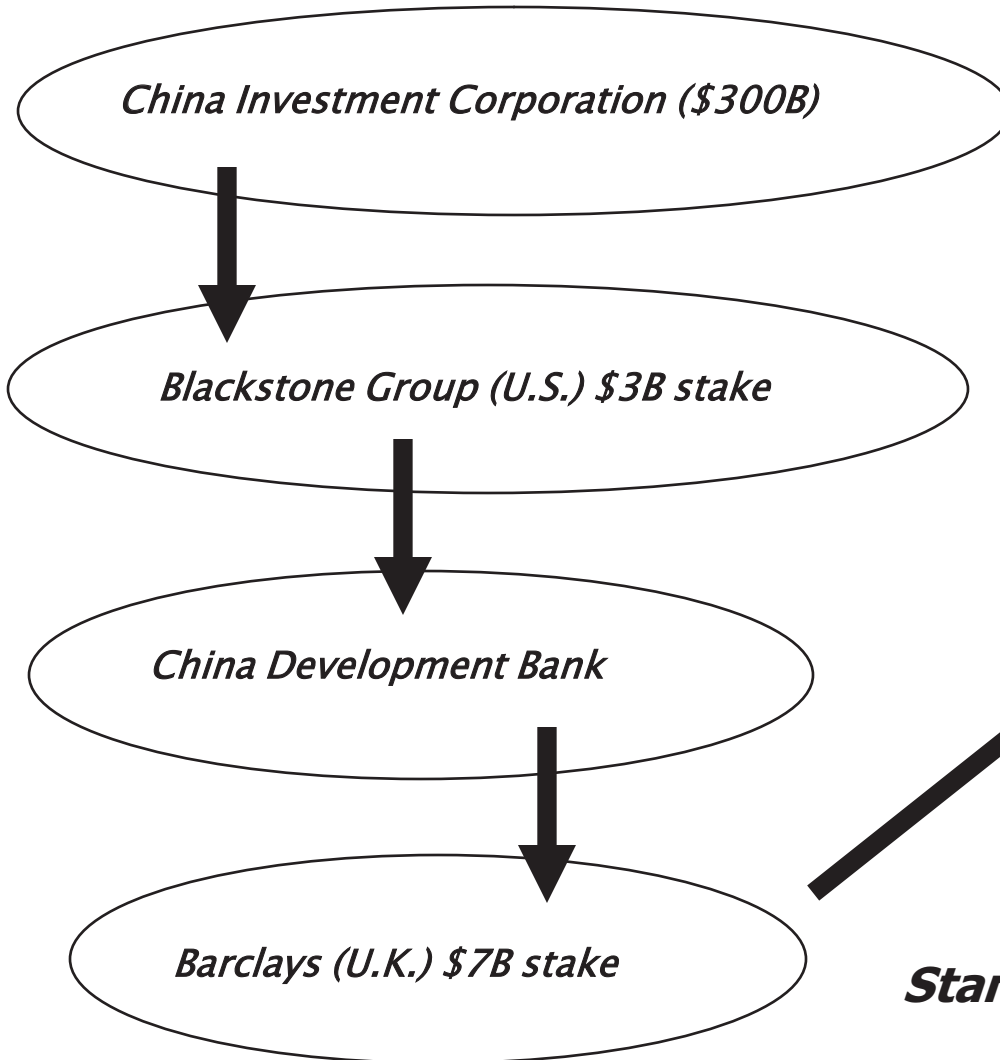
- ⊕ **ID target states**
- ⊕ **State enterprises – secure resource access**
- ⊕ **G.O.C. economic and diplomatic carrots**
  - ⊞ **Long term champion of developing world**
  - ⊞ **Debt forgiveness**
  - ⊞ **Bilateral trade agreements**
  - ⊞ **Development packages**
  - ⊞ **Awarding aid**



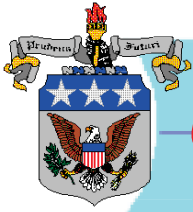
The China National Offshore Oil Corporation (CNOOC) signed an agreement on exploitation of deep sea oil at the south China Sea with Kerr-McGee China Petroleum, 4 Feb 2005



# China Foreign Exchange Reserve \$2.0 Trillion : African Access



**Standard Bank \$5.4B**



# *China's Other Mineral Partners* **CSL**

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- ⊕ Australia – bauxite, iron, coal, gold, copper, nickel, zinc, uranium
- ⊕ Brazil – iron, oil, niobium
- ⊕ Peru – copper, oil
- ⊕ Zimbabwe – chromium, iron
- ⊕ Chile – copper
- ⊕ Russia – oil, gas
- ⊕ Canada – oil, gas, uranium
- ⊕ South Africa – chromium, iron



Rolling mill at an iron and steel plant in Anshan, Liaoning province, China.



# China: Production



COMMODITY	2007 PRODUCTION	VALUE (\$ BILLION)	WORLD RANK
Steel	482 Mt	\$390.4B	1
Aluminum	12 Mt	\$33B	1
Iron Ore	600 Mt	\$37.8B	1
Zinc	2.8 Mt	\$9.3B	2
Copper	920,000 t	\$6.8B	4
Lead	1.32 Mt	\$3.17B	2





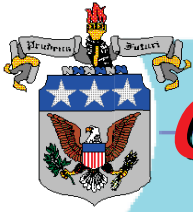


# China: Key Minerals



COMMODITY	2007 PRODUCTION	VALUE (\$ BILLION)	WORLD RANK
Nickel	80,000 t	\$3.0B	8
Cement	1.3 Bt	\$1.32B	1
Bauxite	32 Mt	\$0.86B	2
Yttrium	8,800 t	\$0.75B	1
Antimony	110,000 t	\$0.63B	1
Rare earths	120,000 t	\$0.05B	1

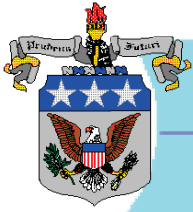




# *China's Mineral Imports to U.S.* **CSL**

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<u>Mineral commodity</u>	<u>Percent of imports to U.S.</u>
✚ Antimony	79%
✚ Barite	90%
✚ Fluorspar	65%
✚ Indium	49%
✚ Magnesium compounds	68%
✚ Rare earths	67%
✚ Tungsten	47%
✚ Yttrium	88%



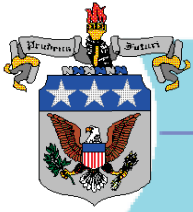
# *Threats to Stability*

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## *Implied Threats*

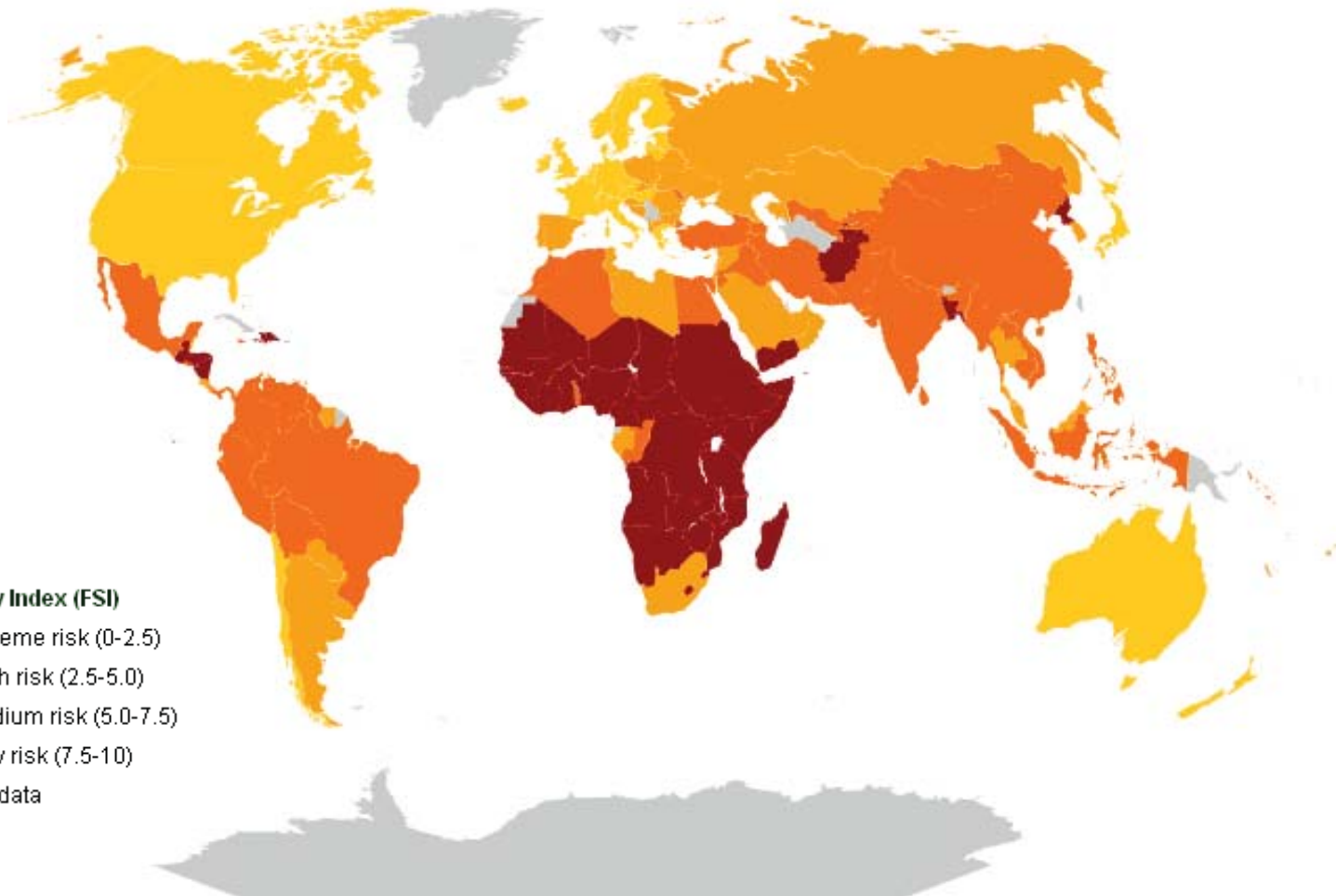
- M **Population Growth**
- M **Resources Scarcity**
- M **Environmental Security**
- M **Migration**
- M **Failed states**
- M **Economic Conditions**





# Global Map of Food Security

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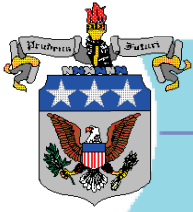
### Food Security Index (FSI)

- Extreme risk (0-2.5)
- High risk (2.5-5.0)
- Medium risk (5.0-7.5)
- Low risk (7.5-10)
- No data



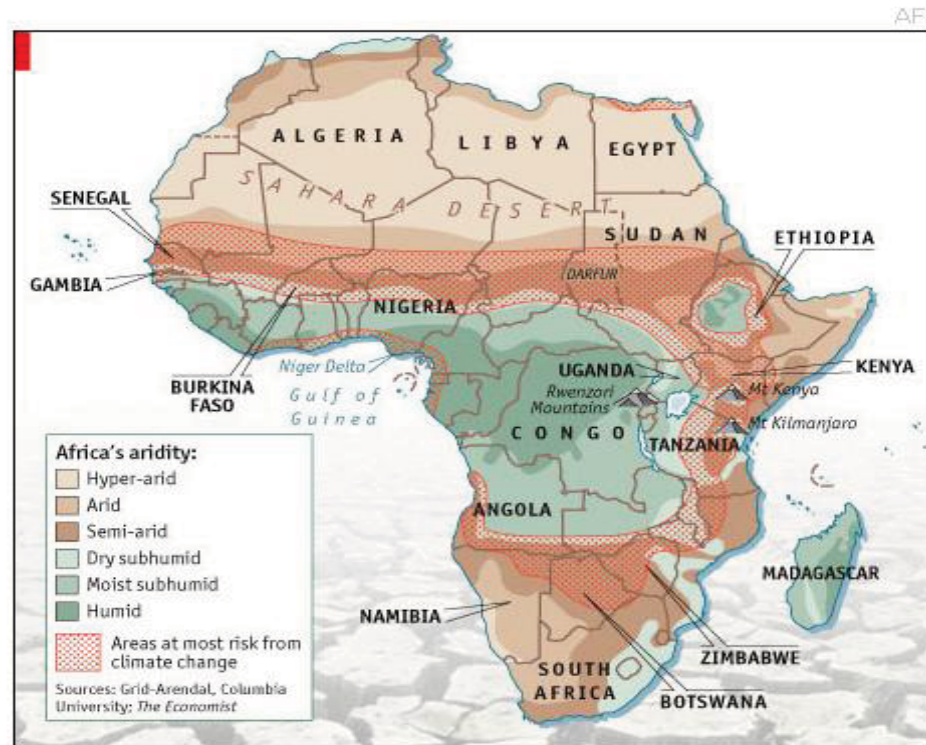






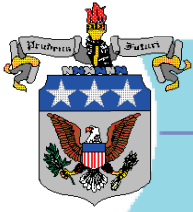
# Climate Change

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*CLIMATE change may have a graver effect on Africa than any other continent, if the predictions of the most recent report by the UN's Intergovernmental Panel on Climate Change hold true. It predicts a minimum increase in temperature of 2.5°C by 2030, and dry areas will expand. Around 600,000 square kilometers of cultivable land may be ruined. Rising sea levels would threaten coastal infrastructure in Egypt, Senegal and the Gulf of Guinea, an important oil-producing region. Another study by the University of Pretoria estimates that \$25 billion may be lost in crop failure because of rising temperatures.*

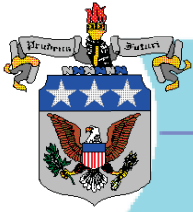




# *Minerals Strategies*

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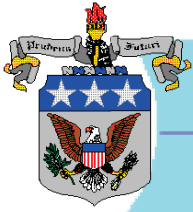
- ✚ **China- “Go Out Strategy” 1999**
- ✚ **European Commission “EU Raw Materials Strategy” 2008**
- ✚ **Japan- “Strategy for Ensuring Stable Supplies of Rare Metals” 2009**
- ✚ **United States ?**



# *Japan's Minerals Strategy* **CSL** Center for Strategic Leadership

## **Four Pillars for Securing Rare Metals:**

- ✦ **Securing Overseas Resources**
- ✦ **Recycling**
- ✦ **Development of Alternative Materials**
- ✦ **Stockpiling**

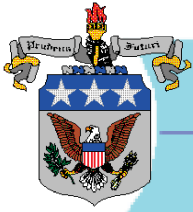


# *EU Minerals Strategy*

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**The Commission's critical raw materials strategy.... based on 3 major pillars:**

- ⊕ **Access to raw materials** on world markets at undistorted conditions
- ⊕ **The right framework to foster sustainable supply of raw materials** from EU sources
- ⊕ **Increase resource efficiency** and promoting **recycling** in the EU



# *Minerals and Security*

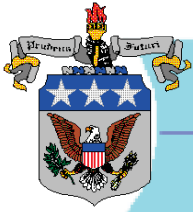
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“The overall objective of a national materials policy for the United States should be to insure an **adequate** and **dependable** flow of materials at the **lowest cost** consistent with the welfare of friendly nations.”

*Paley Commission Report 1952*



*WILLIAM PALEY, 1901–1990*



# *U.S. – China Relations*

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**What are the implications of China's mineral policy for U.S. National Security Interests?**



**Win – Win Situation**

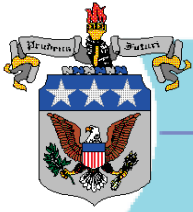
**Or**

**Zero Sum Game**

**?**



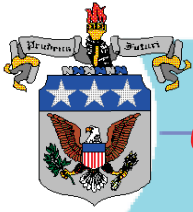




# *Common Interests*

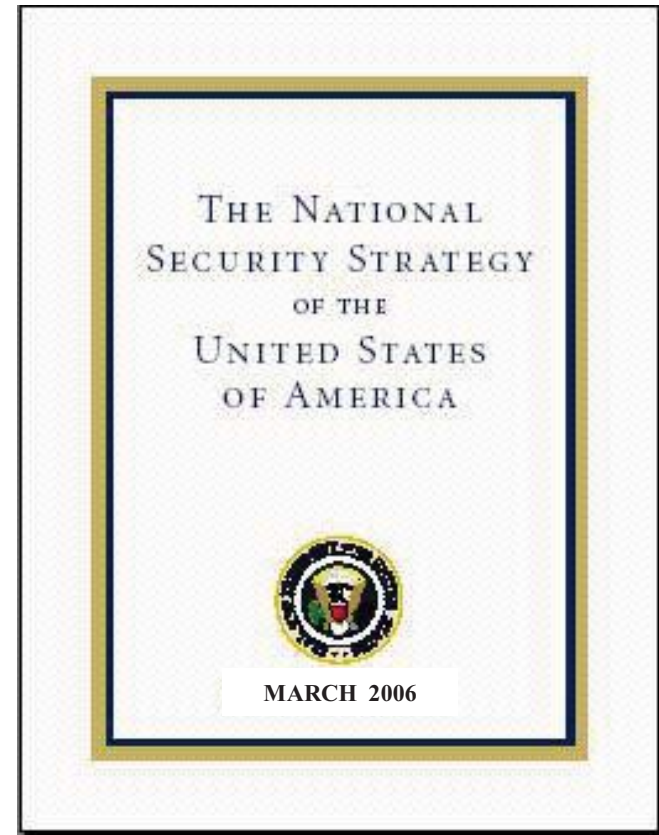
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- ⊕ **Sea Lines of Communication (SLOCs)**
- ⊕ **Regional stability**
- ⊕ **Reasonable raw material prices**
- ⊕ **Terrorism**



# *U.S. National Security Strategy* Center for Strategic Leadership **CSL**

- **Defense**
- **Diplomacy**
- **Development**
- **Private Sector**

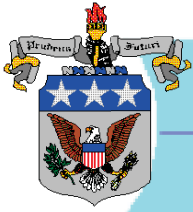




# ***POLICIES OPTIONS?***

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- ⊕ **Develop a National Plan for Strategic and Critical Resources.**
- ⊕ **Revitalize the National Defense Stockpile.**
- ⊕ **Include Strategic Minerals as a Vital Interest of the NSS.**
  - ⊕ **Priority in QDR and National Defense Strategy**
  - ⊕ **Salient Objective of Diplomacy and Development -QDDR**
  - ⊕ **Include the Private Sector in Strategy**
  - ⊕ **Make Strategic Minerals an Intelligence Community Priority**
- ⊕ **Strategic Communication to Congress, Public: Why Important!**
- ⊕ **Energy and Climate Change Strategy Should Include:  
Recycling; Substitution; Reuse; Remanufacture**



# Questions?

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