

Environmental Geography of Southeast Asia Case Study:

Grasberg Mineral District

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Grasberg Mineral District

- Located on New Guinea in Indonesia
- Single largest reserve of gold in the world
- Second largest reserve of copper
- The mine is owned by Freeport McMoRan Copper and Gold, which has a controlling interest, the Government of Indonesia and 2 other companies.
- The mine is operated by PT Freeport Indonesia and employs 18,000 people.



Freeport-McMoRan

- Freeport-McMoRan is a global mineral mining company.
- Copper, gold, molybdenum, and cobalt are the primary minerals they mine.
- Freeport-McMoRan began mining in Grasberg in the early 1970's.
- One billion pounds of copper and 1 – 2 ½ million ounces of gold per year are produced.
- Watch a video produced by Freeport-McMoRan about their global operations.
 - http://www.fcx.com/videos/Connect_English.htm



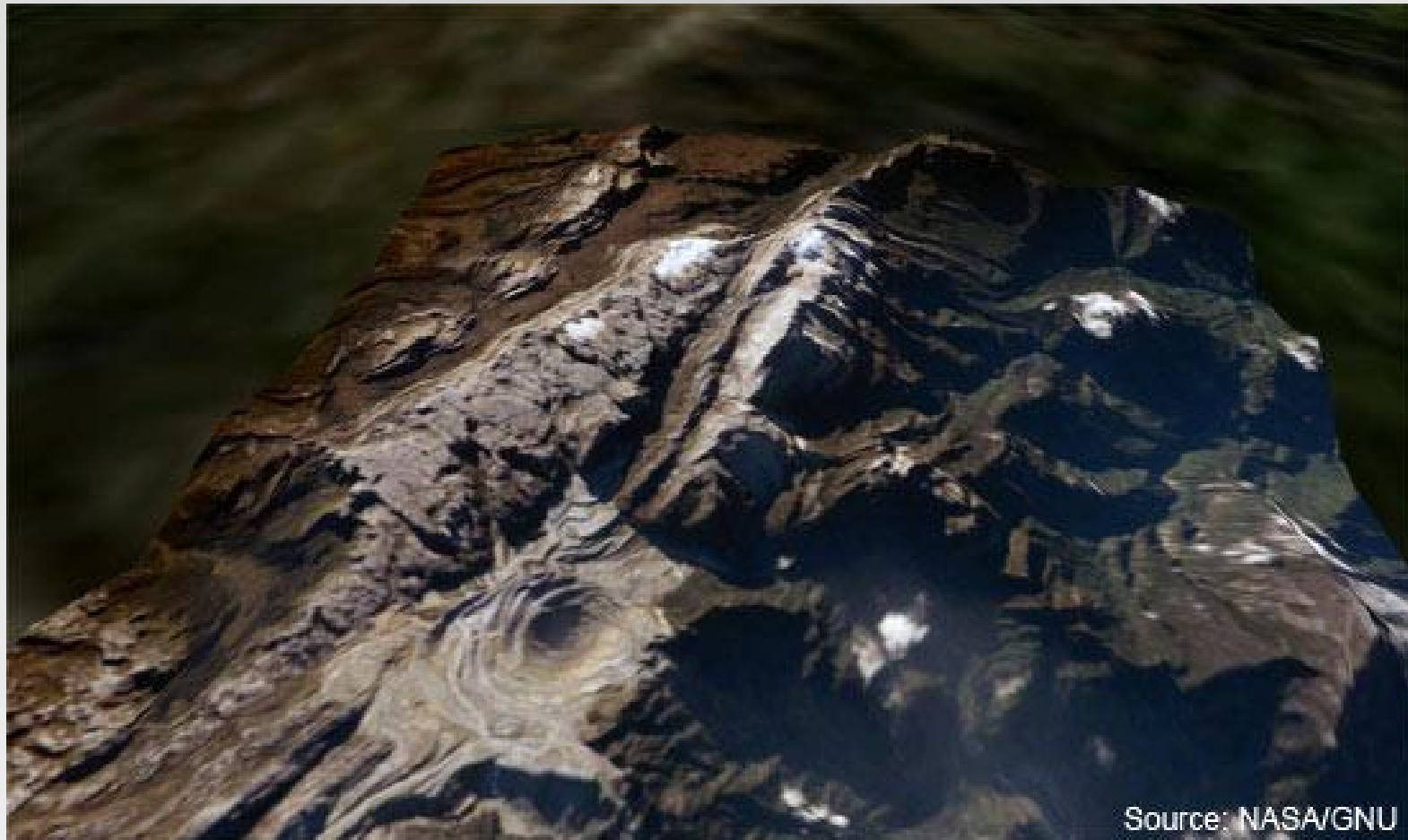
Open Pit Mine

- Mine was originally a mountain over 4000 meters high.
- The mine is 3000 meters deep at present.
- Open pit will be exhausted around 2015





Satellite view of the mine



Source: NASA/GNU



A Perspective of how large the mine really is





Environmental Impact

- After extracting the minerals, the overburden and waste rock are discharged to the side of the mine.
- Overburden and waste rock amount to about 360,000 to 510,000 tons a day.
- A great deal of these tailings are discharged into the Aghawagon River and then on into the Otomona River.
- The tailings settle into the flood plain, which runs through the rainforest or are dumped into the Arafura sea.



Grasberg mine tailings





Environmental impact

- Waste rock is up to 900 feet deep and covers 3 square miles.
- Waste rock contains sulphurous minerals, which create sulphuric acid when exposed to water.
- Other heavy metals also infiltrate the ground water.



Environmental Impact

- Many of the nearby rivers and wetlands are now considered “unsuitable for aquatic life” – according to a study performed in 2002.
- Springs miles away have begun turning green – an indication of the presence of copper in the water.
- The pollution is threatening nearby Lorentz National Park – a rainforest protected as a UNESCO Heritage Site.



Social impact

- Local tribes do not always feel they are receiving their fair share.
- The area has long felt isolated from the rest of the country due to its distance and its religious and cultural differences.
- Freeport has invested heavily in Indonesia's politicians in order to ensure their continued support of the project.
- Freeport also spends a great deal of money on military in the area to protect from riots and insurrections like the one in 1996 which resulted in the destruction of \$3 million of equipment.



Mine borders a Unesco heritage Site





Notes & Credits

- Slide 3
 - Source: http://www.fcx.com/videos/Connect_English.htm
- Slide 4
 - Source: <http://www.mining-technology.com/projects/grasbergopenpit/>
- Slide 5
 - Source: <http://www.mining-technology.com/projects/grasbergopenpit/grasbergopenpit2.html>
- Slide 6
 - <http://www.mining-technology.com/projects/grasbergopenpit/grasbergopenpit4.html>
- Slide 7
 - Source: <http://www.minesandcommunities.org/article.php?a=8809>
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 - Source: <http://www.austinchronicle.com/news/2005-09-23/292540/>
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 - Source: http://www.nytimes.com/2005/12/27/international/asia/27gold.html?pagewanted=all&_r=0
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