

# Science in the Community

From Wyoming to Minnesota and Iowa

# Bear Mound/Devils Tower Breakout groups

- Select one to two people to design content / take notes
- Select one to two people to communicate your team's work to the whole class
- Everyone works together using their notes, book, labs, developing knowledge to...
- **Each group will address...**
  - 1. Explain the geologic history of the area. Visually and orally**
    - a. Basic differences between igneous intrusive and extrusive rock.**
    - b. Concept of relative and numeric age dating**
    - c. Societal importance to characterizing and interpreting the area's geology.**
  - 2. The area surrounding this site is being reviewed for further development (homes, roads, agriculture, tourism)**
    - a. How is geology related to the area's environment and/or ecology?**
    - b. What aspects are important to your communication of the science?**
    - c. Who should be a part of development discussions? What types of information will need to make the 'right' decisions?**

You are faced with a problem where you need to teach or explain the formation of Devils Tower and its current environmental characteristics to a diverse audience within your 'chosen' profession

(High school science teacher, Park Ranger Naturalist, OR Environmental consultant)

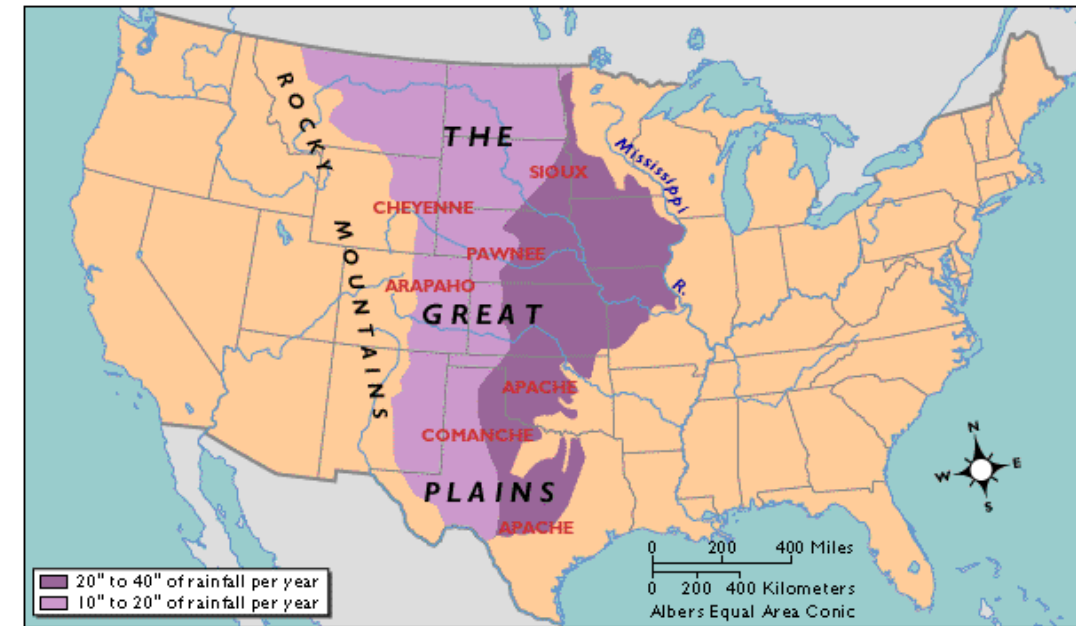
Part of your audience has strong Native American family ties, while other parts have very little understanding of geology, both groups will need to use the information you are providing to vote on an upcoming development project near Devils Tower.







## Great Plains

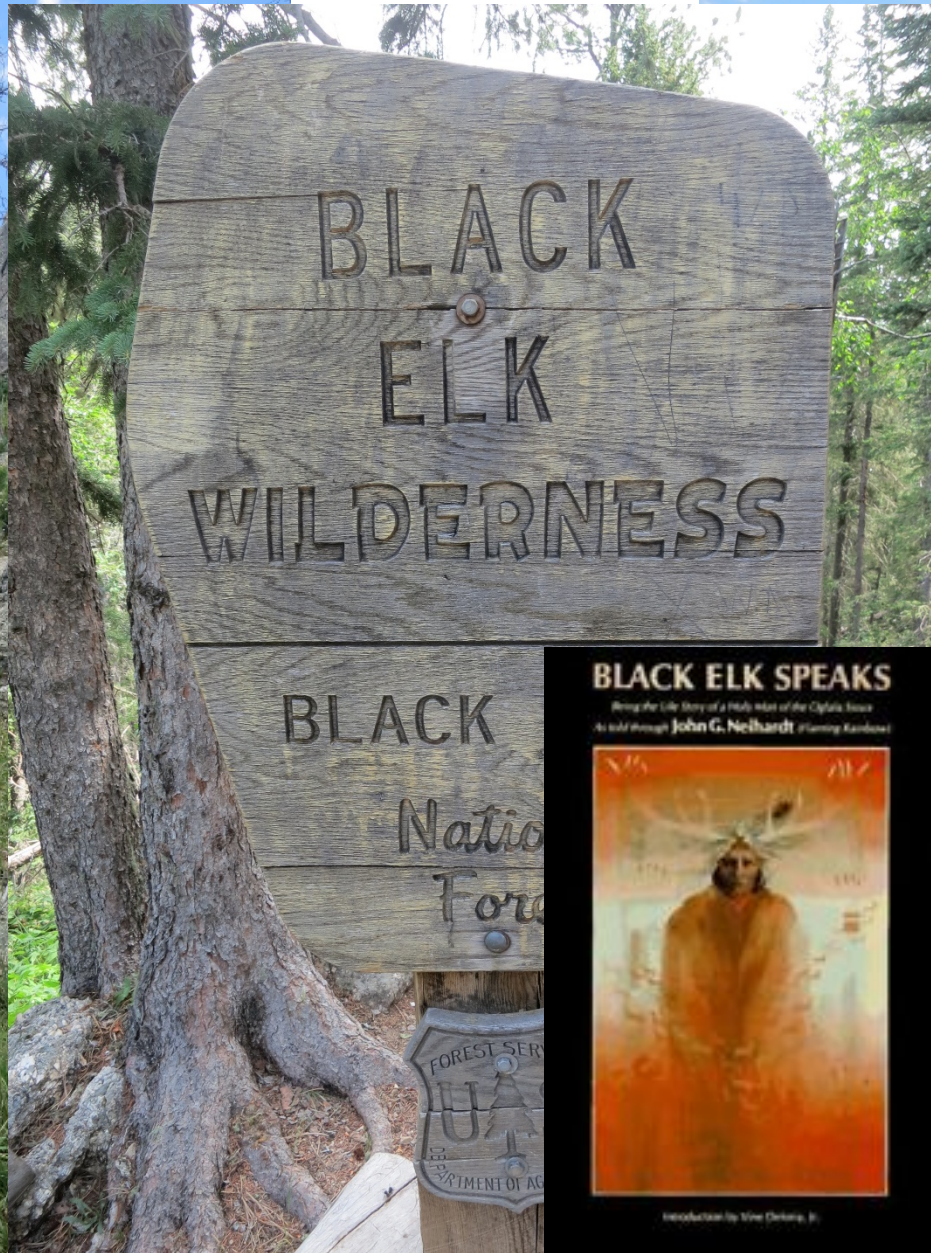




Harney Peak



Black Elk Peak, 2016

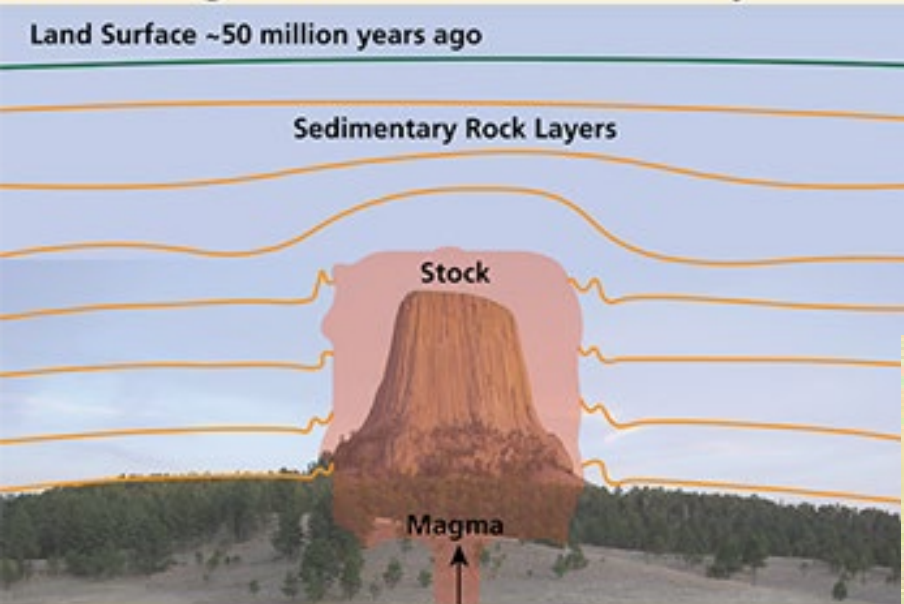




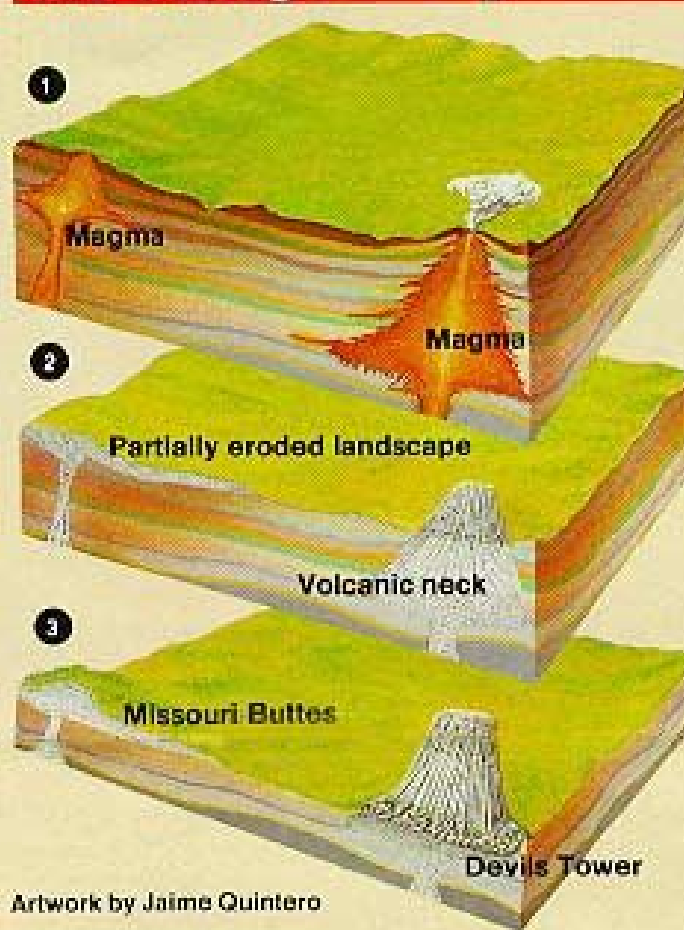




# Figure 1: Stock Theory

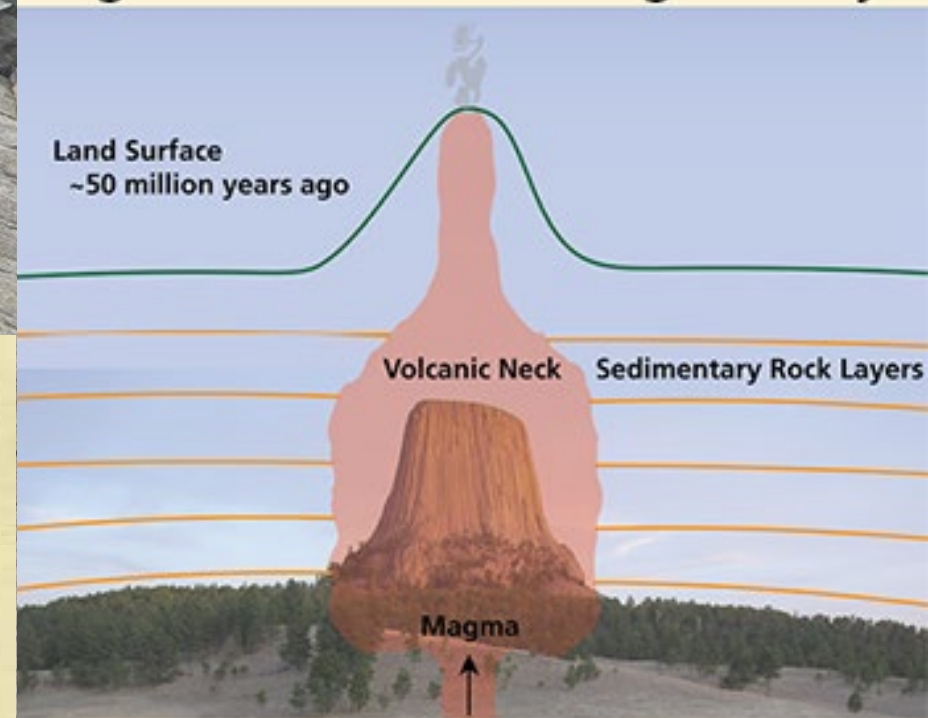


## The Geological Story

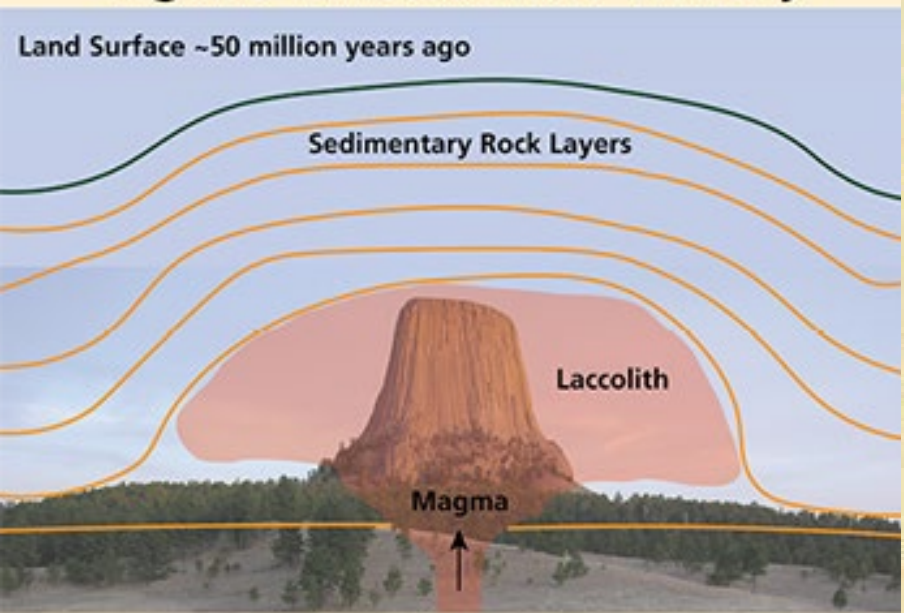


Artwork by Jaime Quintero

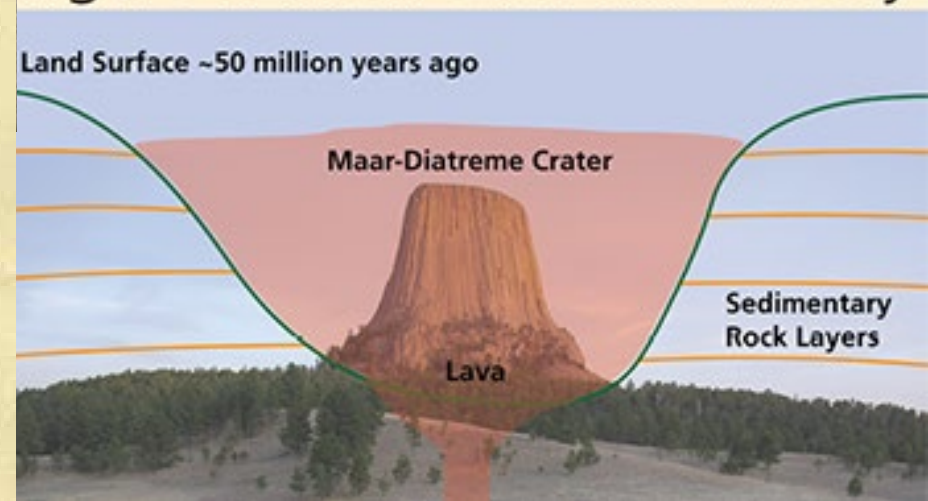
# Figure 3: Volcanic Plug Theory



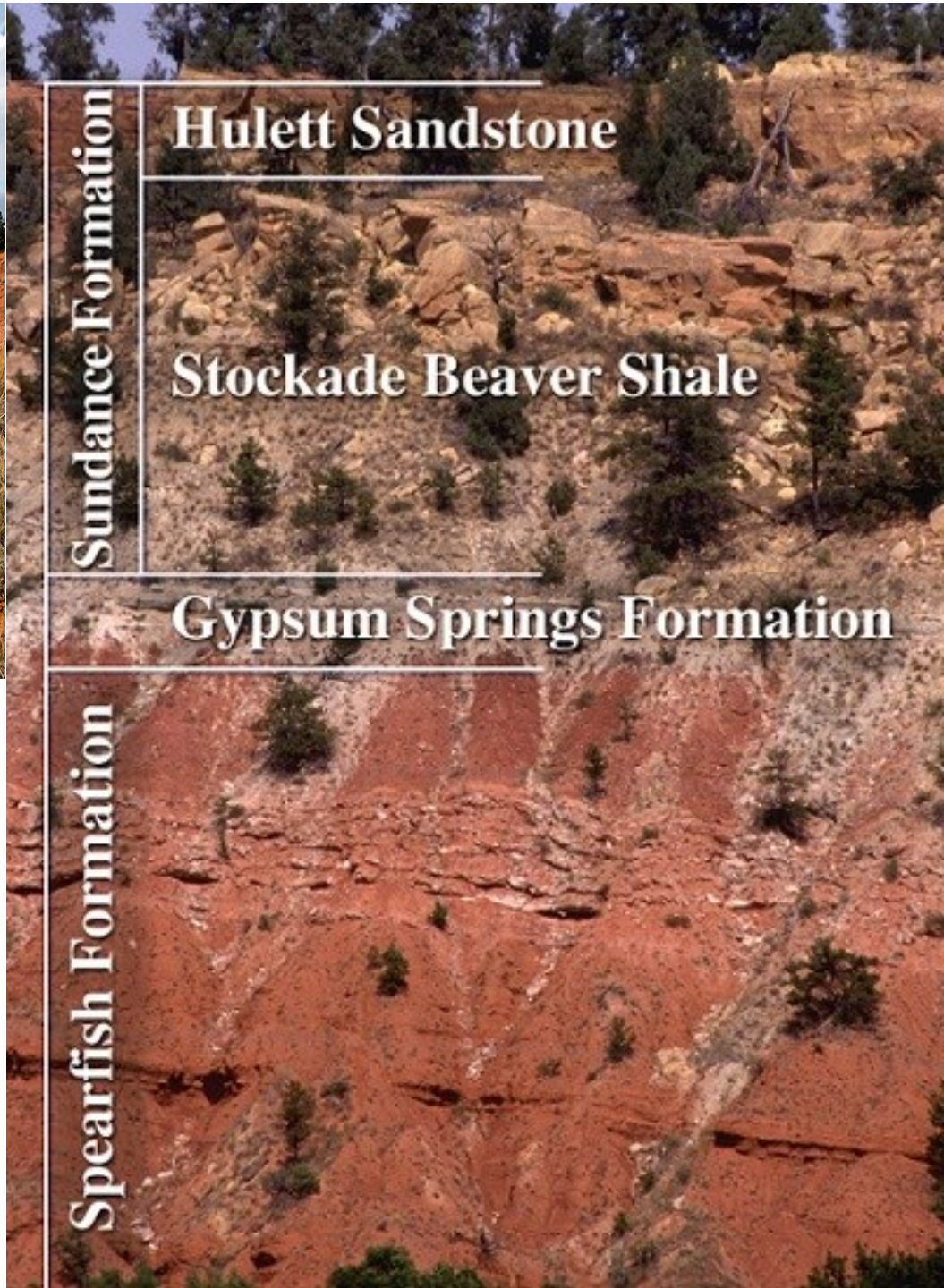
# Figure 2: Laccolith Theory



# Figure 4: Maar-Diatreme Theory







Sundance Formation

Hulett Sandstone

Stockade Beaver Shale

Gypsum Springs Formation

Spearfish Formation





**Phonolite**  
**Type of granite**  
**porphyry**

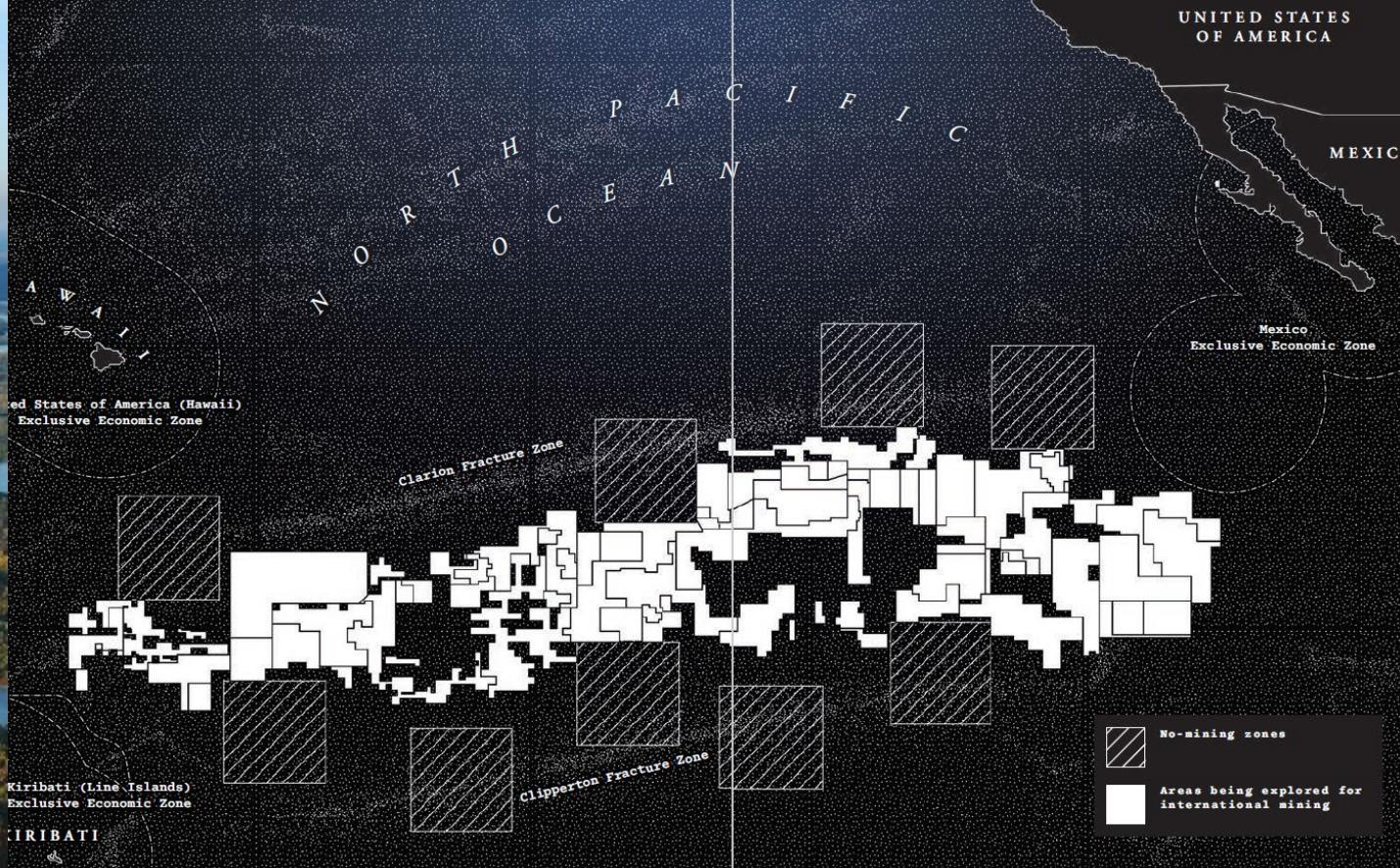


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20,000 Feet Under the Sea, The Atlantic,  
Jan/Feb 2020, V.325, No.1, by Will S. Hylton

## In Northern Minnesota, Two Economies Square Off: Mining vs. Wilderness

Proposed mines near the Boundary Waters have become the latest front in the fight over who gets to profit from America's natural resources. NY Times Oct. 17, 2017 Reid Forgrave



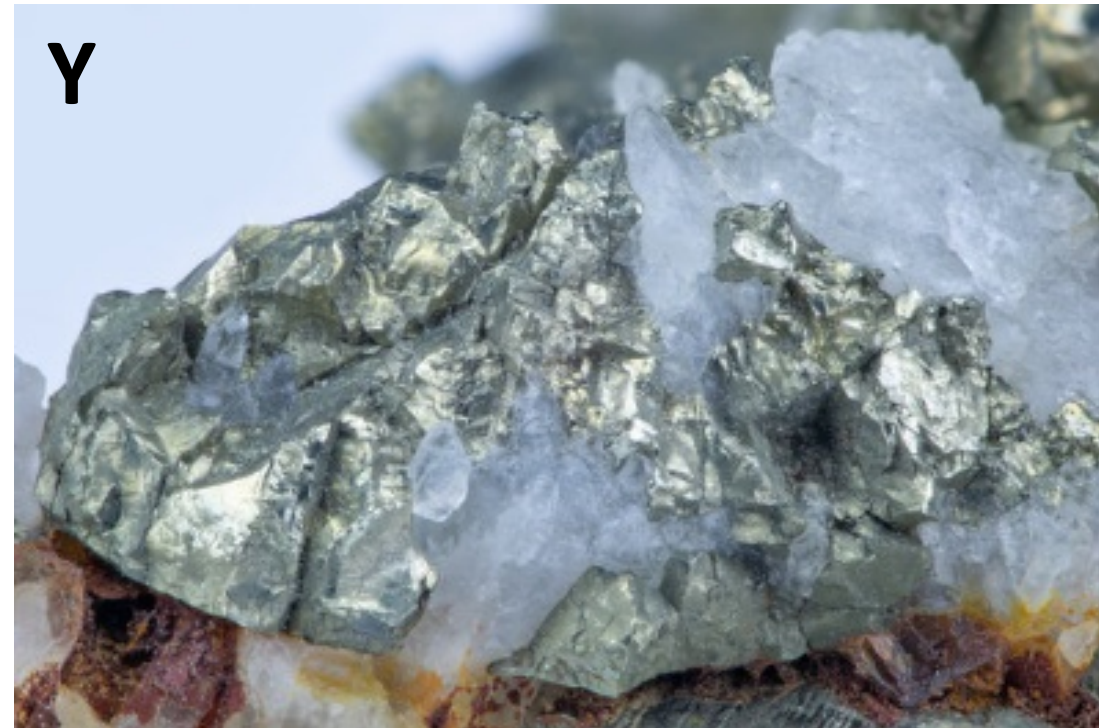
# Minnesota and Iowa Mining discussion

- Q1 – Provide background/context paragraphs for each major prospective
  - A. Mining 1 paragraph
  - B. Environmental 1 paragraph



# Q2

- A. What are the two primary categories for Mining natural resources?
- B. Place the provided samples into those two categories.
- C. Which of these samples would it make the most sense to mine, justify.





# Minerals

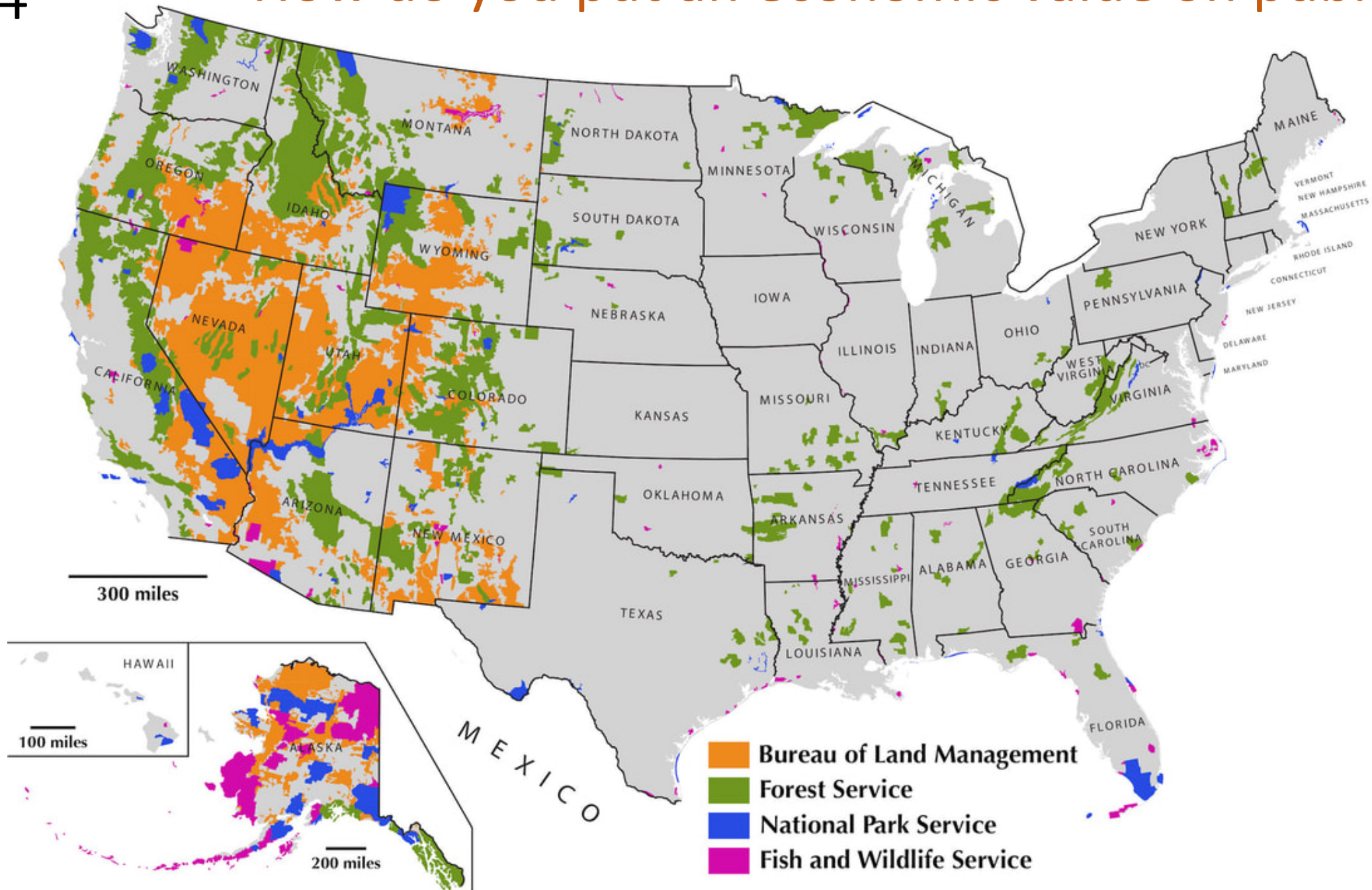
Briefly describe how mined products are used, why are they important?

Look up uses for prominent potential Minnesota and Iowa mineral

- A. Differences between Base and Precious metals
- B. Nickel
- C. Copper
- D. Platinum
- E. Palladium

Q4

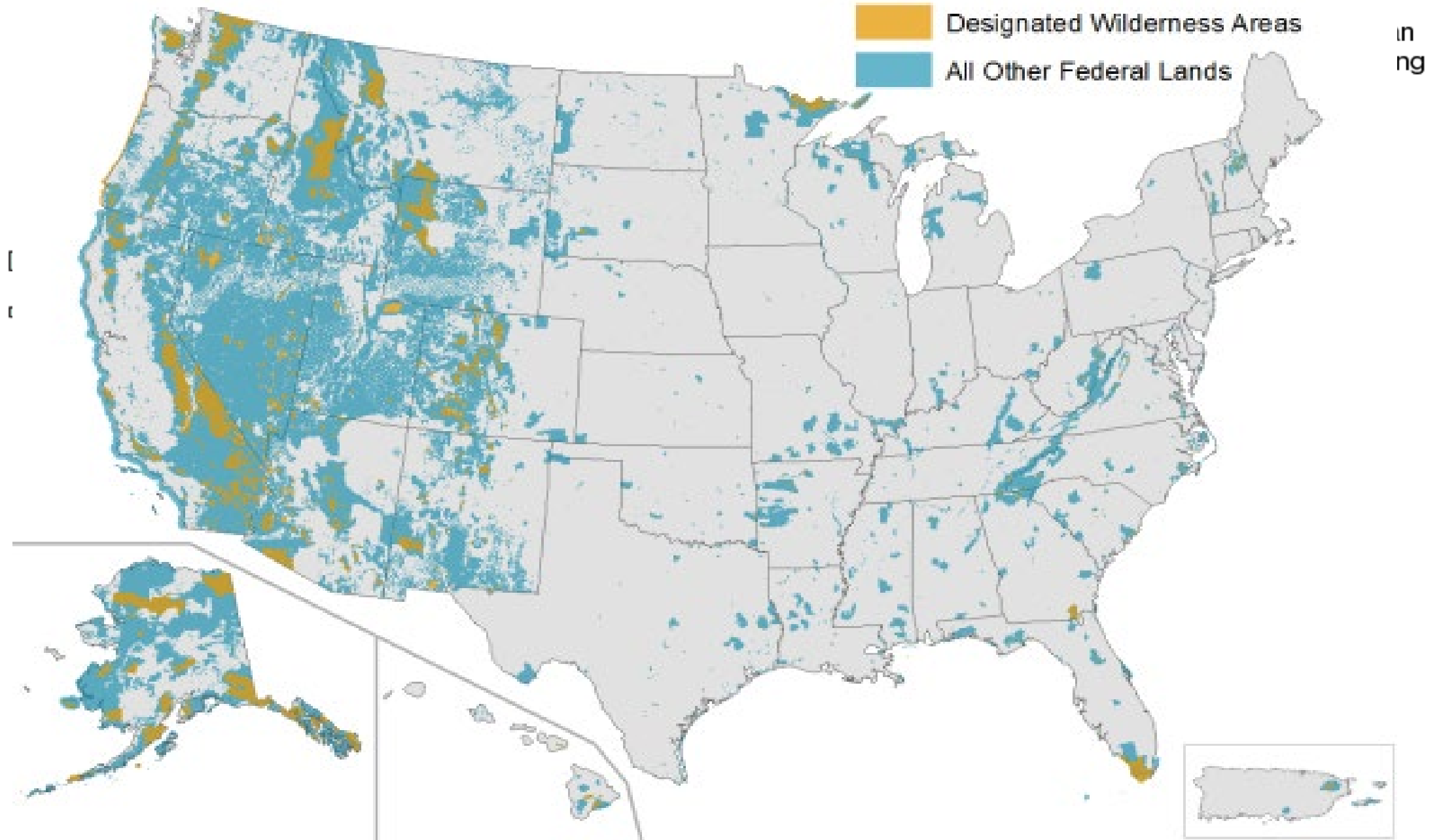
# How do you put an economic value on public lands?





# How should competing claims of wilderness/environment mining be addressed?

## Q5

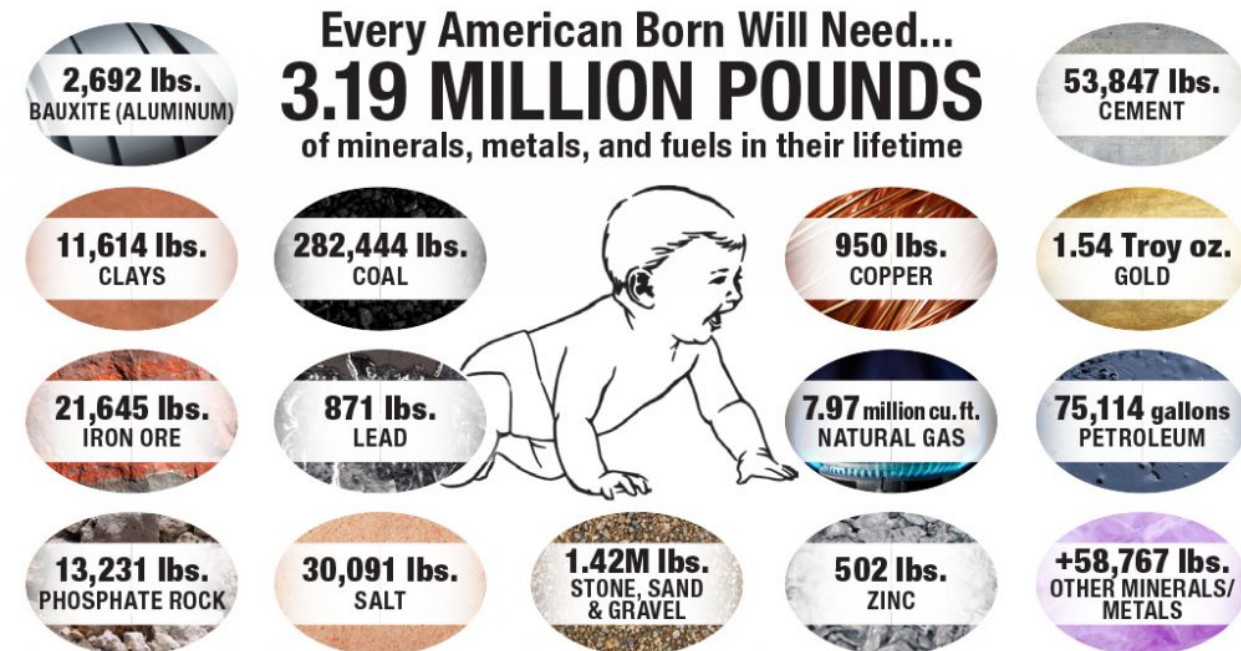




# To Mine or not to Mine?

[https://www.bozemandailychronicle.com/news/environment/environmentalists-miners-face-off-over-mining-bill/article\\_37f70b8a-8899-59eb-a093-aacc73d7ae2f.html](https://www.bozemandailychronicle.com/news/environment/environmentalists-miners-face-off-over-mining-bill/article_37f70b8a-8899-59eb-a093-aacc73d7ae2f.html)

<https://mineralseducationcoalition.org/>



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Learn more at [www.MineralsEducationCoalition.org](http://www.MineralsEducationCoalition.org)



<http://www.rmmagazine.com/2014/08/01/worlds-deadliest-mine-disasters/>

