



Department of Geology & Geography

Kennecott Copper Mine, UT

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HISTORY

Kennecott Utah Copper Mine (KUC) is located in Bingham Canyon 28 miles southwest of Salt Lake City, Utah and is operated by Rio Trinto since 1989. The open-pit mine opened in 1903 and revolutionized the copper mining industry, setting precedent for large open-pit mines. As the second largest copper producer in the United States, KUC provides about 13 percent of the country's copper needs. KUC is the largest man-made excavation in the world.



- ★ Open pit mine
- ★ Tailings pond

FACTS

KUC is an engineering marvel, and is over 3/4 miles deep and approximately 3 miles wide at the top, and still growing. The mine has produced more ore, 18.1 million tons, than any mine in the world. Every year KUC produces 300,000 tons of copper, 500,000 ounces of gold, 4 million ounces of silver, approximately 30 million pounds of molybdenum (often used in high-strength steel products), and about 1 million tons of sulfuric acid (a by-product of the smelting process). Rio Trinto has spent more than \$350 million on cleanup of historic mining waste and over \$100 million on groundwater cleanup. Approximately 80 mi² of impacted land in the southwestern portion of Salt Lake County is contributed to mining practices. The open pit operations are projected to extend until 2028.

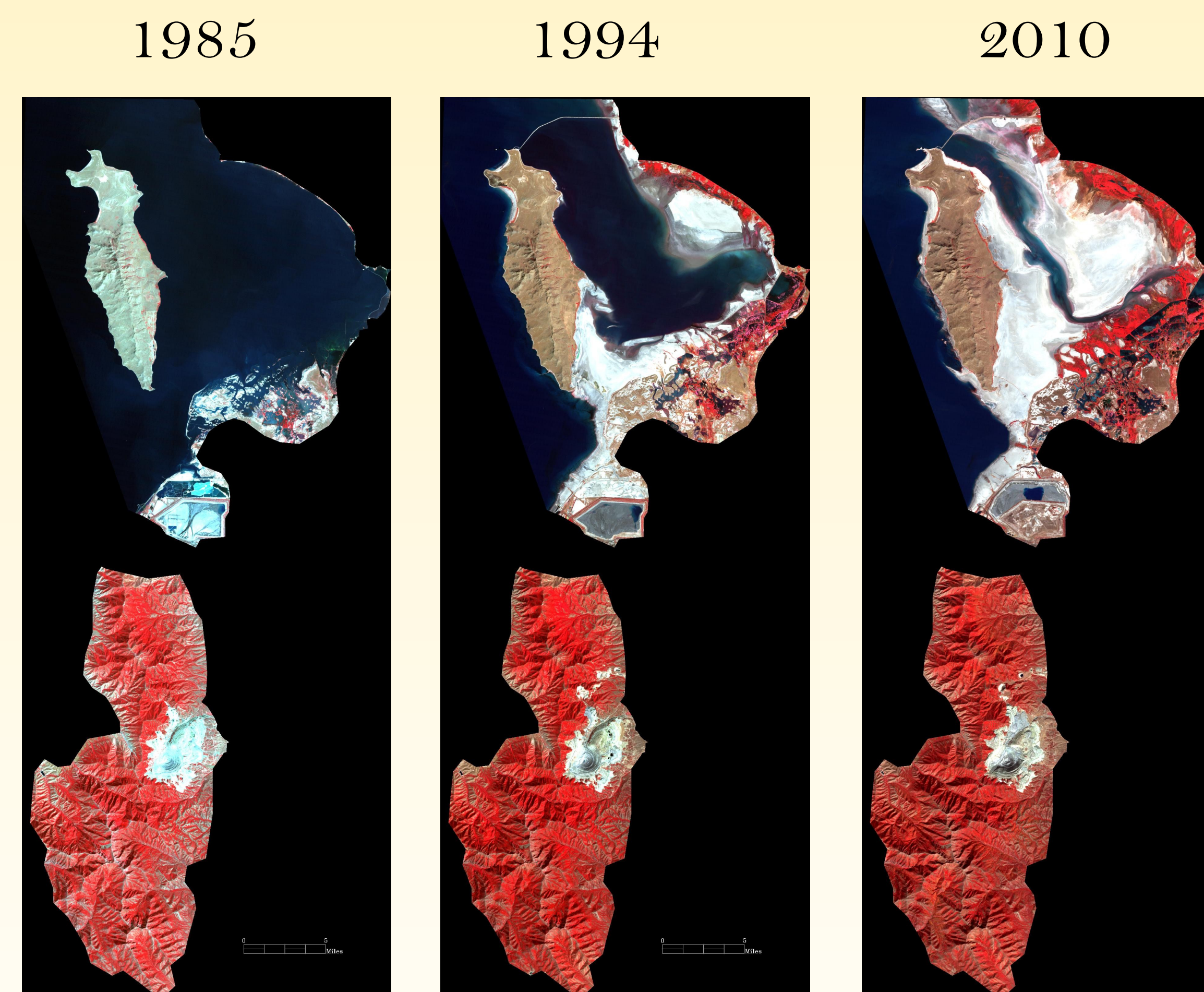
PURPOSE OF STUDY

This study assessed the rate of mine expansion, vegetation loss, and loss of area in the southeast portion of The Great Salt Lake through mining practices. Future projections of loss of land use due to further mining practices in the area southwest of Salt Lake City, Utah.

METHODS

Study Area is approximately 28 miles southwest of Salt Lake City, Utah; Latitude 40° 31' 20" N Longitude 112° 8' 55" W. Clipped to 963 km² (Tailings Pond) and 348 km² (Open pit mine). Images from USGS Earth Explorer; Landsat 4-5. Image Dates: August 1985, August 1994, September 2010.

ORIGINAL IMAGES



10 km Image in false infrared where vegetation is represented in red.

REFERENCES

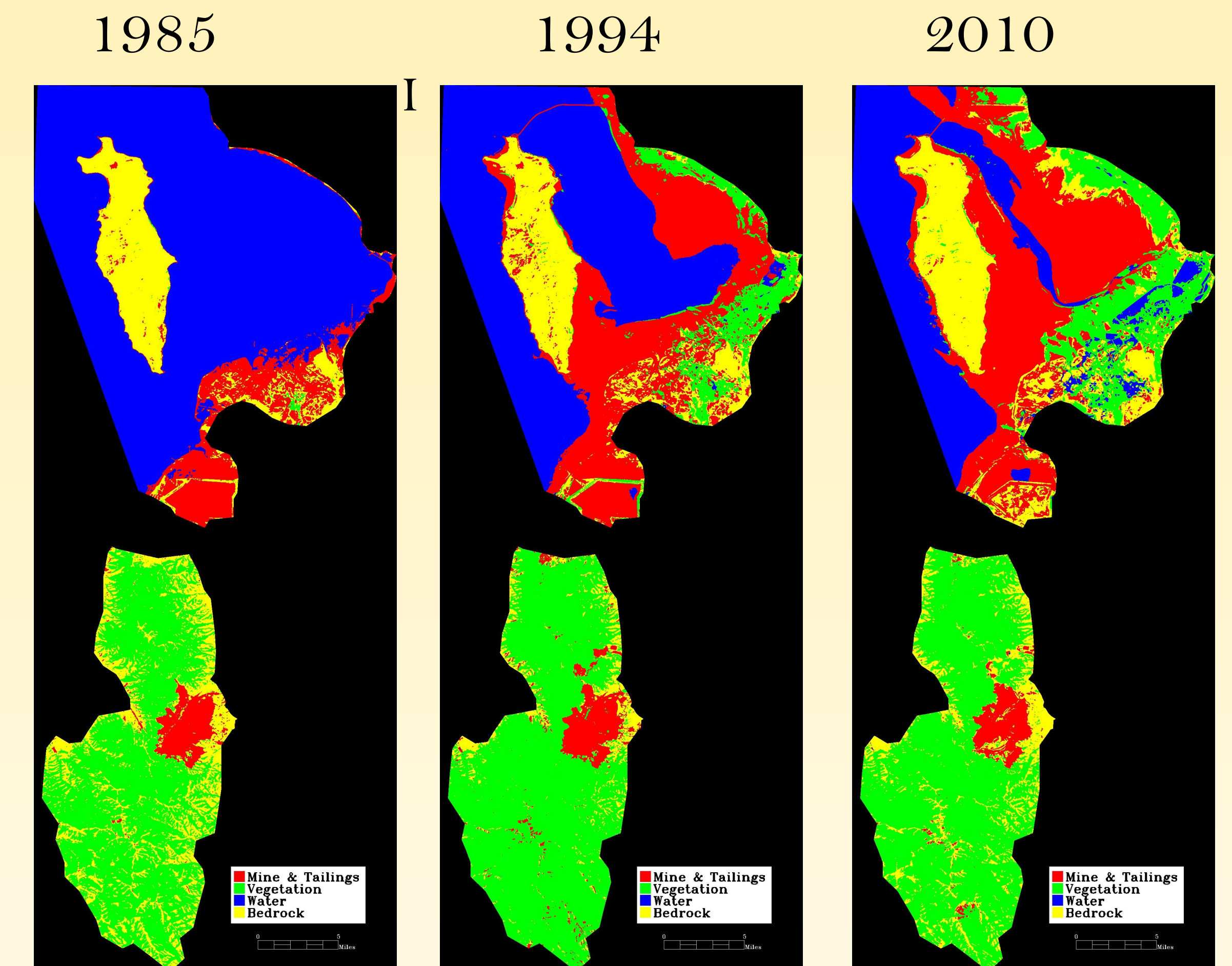
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<http://www.kennecott.com/our-company>.

SUPERVISED CLASSIFICATION



10 km Images were classified into 4 categories: Mine activity and mine tailing (red), Vegetated Areas (green), Water (blue), and Bedrock and undisturbed areas (yellow). Confusion matrix indicated that the accuracy was 100%, 98%, and 99% for 1985, 1994, and 2010 images respectively. Change detection was performed and reported in the results section.

RESULTS

| Year | Mine/Tailings | | | Water | | |
|------|-------------------------|------------------------------------|-------------------|-------------------------|------------------------------------|-------------------|
| | Area (km ²) | Change per year (km ²) | % Change per year | Area (km ²) | Change per year (km ²) | % Change per year |
| 1985 | 146.06 | --- | --- | 715.24 | --- | --- |
| 1994 | 349.56 | 22.61 | 26.60 | 435.94 | -19.95 | -18.23 |
| 2010 | 401.46 | 3.24 | 7.18 | 257.74 | -11.14 | -10.57 |
| 2028 | 446.46 | 2.50 | 6.18 | 140.74 | -6.5 | -10.17 |

CONCLUSION

The mine and tailings area has increased an average of 10% over the past 25 year, while the water in the southern Great Salt Lake has diminished by an age of 11% over the past 25 years. Mining has slowed and is projected to produce through 2028.