



# IWRA

*International Water Resources Association*



**EL COLEGIO  
DE SONORA**

## **Water, climate change, and large-scale mining in Sonora, Mexico: *Emerging challenges for rural water security***

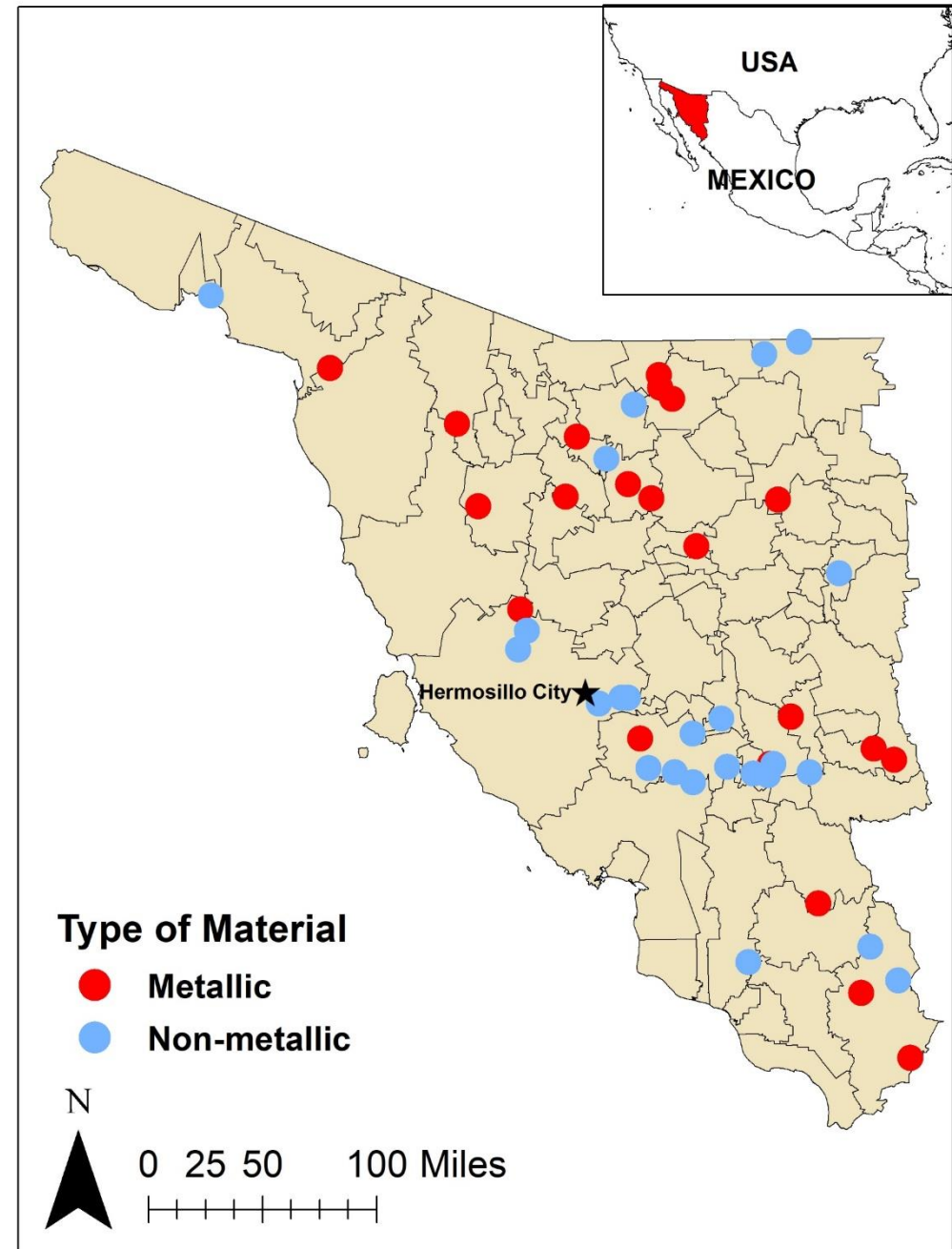
**IWRA Webinar “The Global Water Security Challenge”**

**America N. Lutz Ley, Ph.D.  
El Colegio de Sonora  
Hermosillo, Mexico**

**April 16, 2019**

# Mining in Sonora

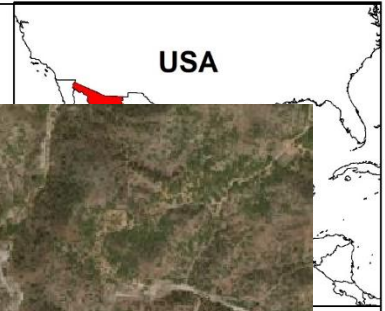
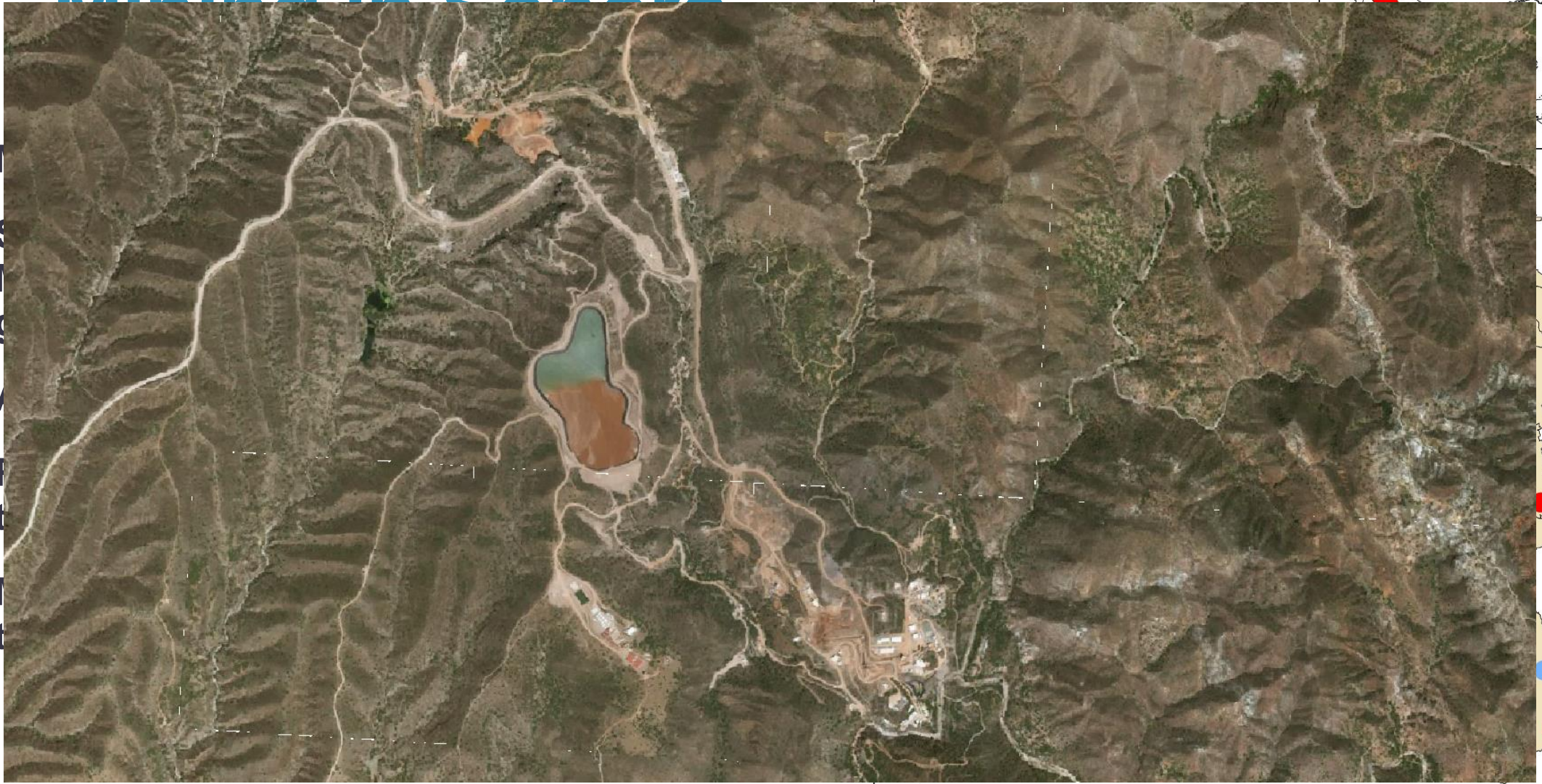
- Mining: 17% of the state's GDP
- Sonora: 1st producer of gold and copper in MX (and the only producer of molybdenum, graphite, and wollastonite)
- Approx. 42 active mines in Sonora
- Processing installed capacity is 200,000 tons/day
- Mining land concessions covered 29% of the state up to 2017



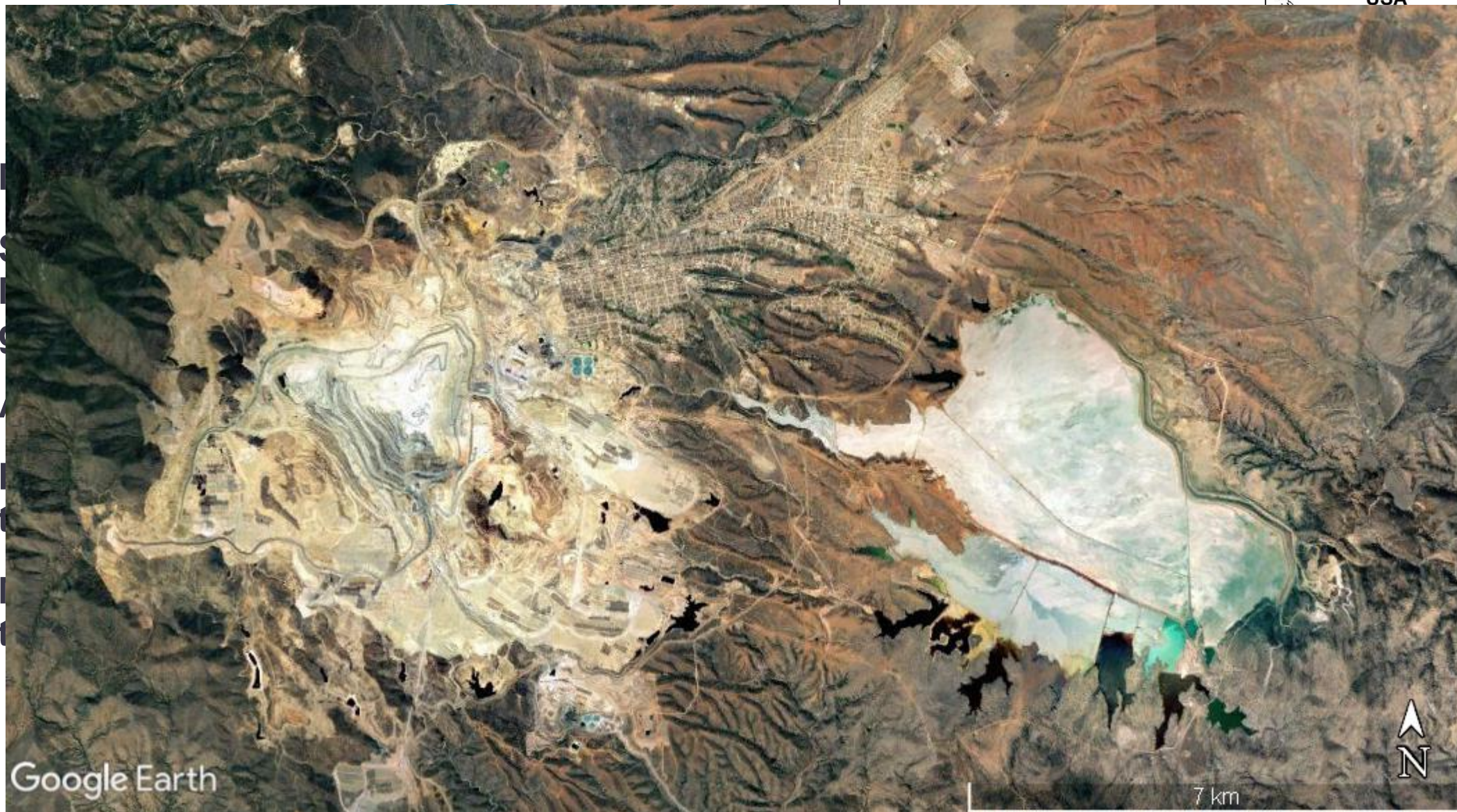


# Mining in Canada

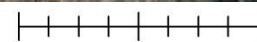
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USA



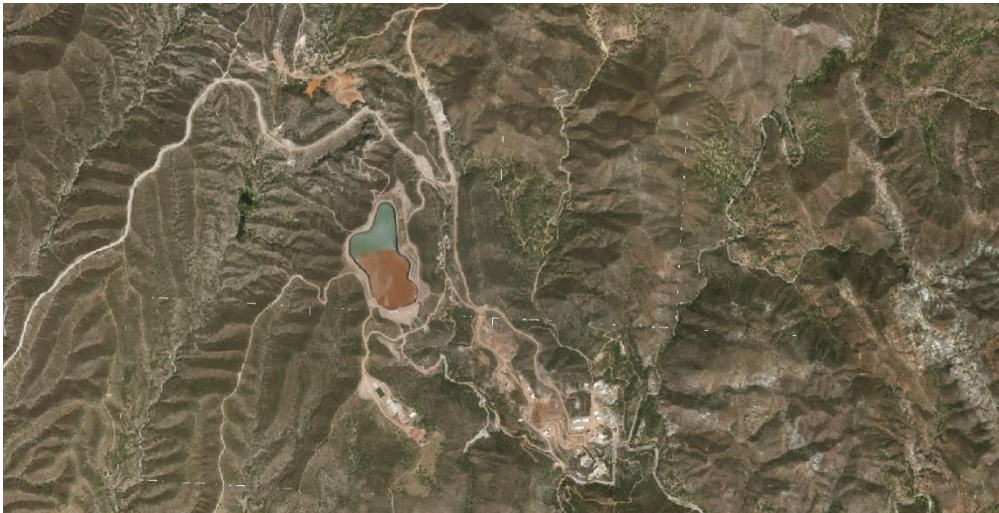


# Water and Mining in Sonora



**CartoCrítica**  
INVESTIGACIÓN, MAPAS Y DATOS  
PARA LA SOCIEDAD CIVIL

HEINRICH BÖLL STIFTUNG  
MÉXICO, CENTROAMÉRICA Y EL CARIBE



The NGO “CartoCrítica” and Heinrich-Böll analyzed data from REPDA in 2014, and found that...

- 1,036 water right titles in hands of 230 mining corporations
- 437 million cubic meters of water per year
- Enough to satisfy the average demand of 3.3 million Mexicans
- Sonora was the major single user with 107 Mm<sup>3</sup>/year
- Underestimations are a big issue
- Lack of metering and surveillance in the countryside

# Water Security in the Spotlight

**Climate change  
regional  
projections**

**Increasing large-  
scale, globalized  
mining**

**De-agrarianization  
and  
impoverishment of  
rural livelihoods**

**How large-scale mining activities interact with other rural livelihoods?**



**How climate change would affect rural large-scale mining, and what do mines and communities are doing to adapt?**



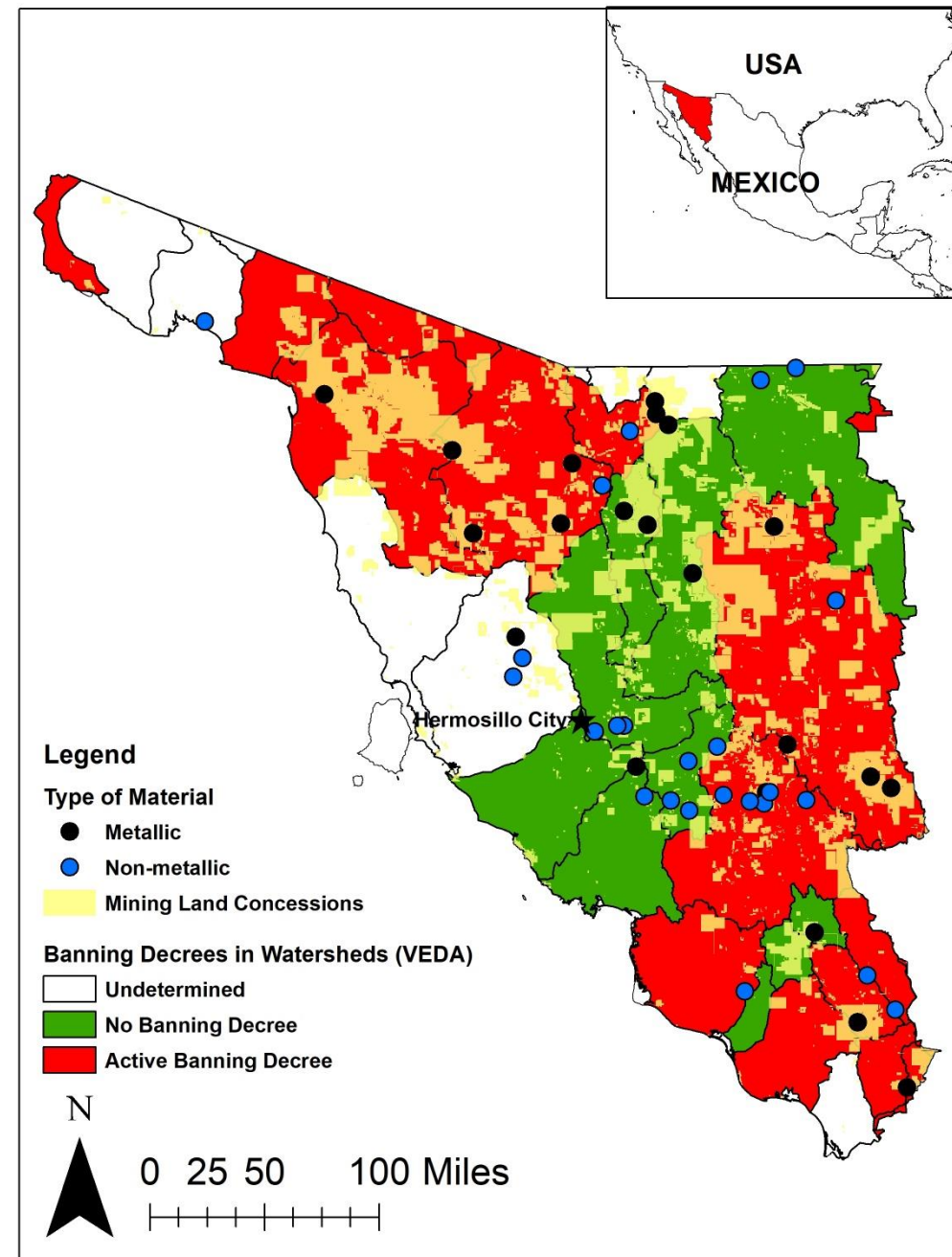
**How the adaptation strategies by this global-market sector would pose new challenges for local rural livelihoods through water security impacts?**

# Exploring Interactions: An example

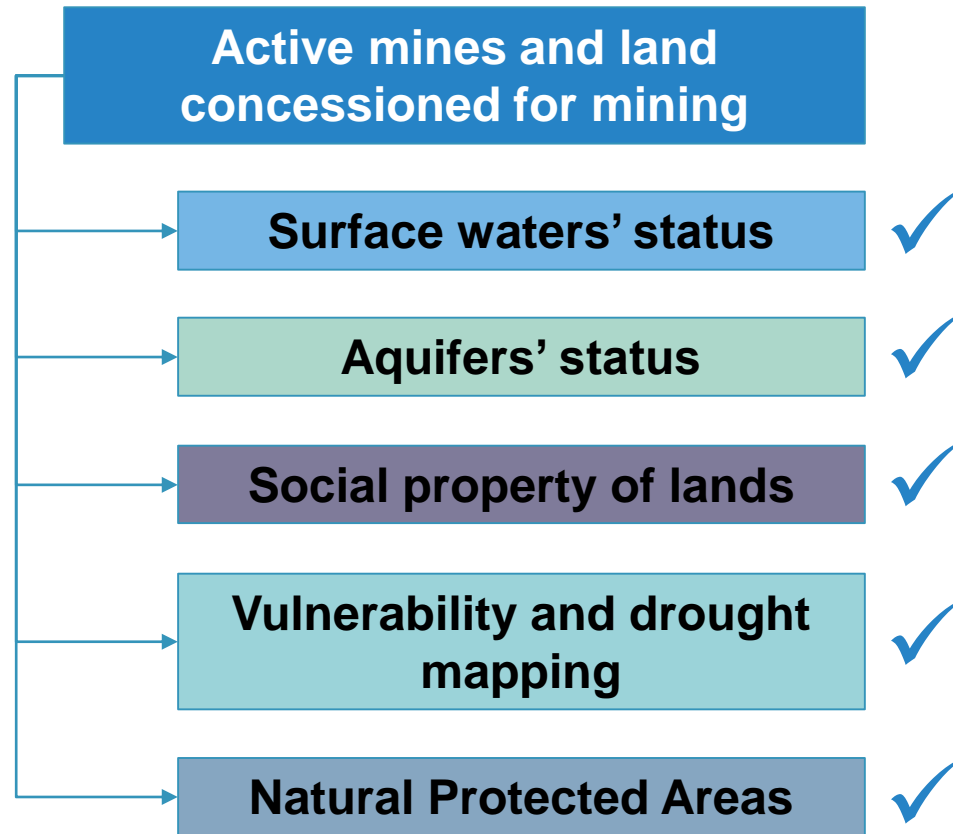


| Status of banning     | Area under mining concessions |
|-----------------------|-------------------------------|
| Undetermined          | 8.4%                          |
| No banning decree     | 19.8%                         |
| Active banning decree | 27.8%                         |

*One third of the total area of watersheds with water extraction banning decrees is concessioned for mining exploration and extraction.*



# Exploring Interactions





# Take-Home Messages

- **Lack of coherence between management frames indicate institutional mismatches or gaps and can foster social conflicts.**
- **Single-sector analyses are insufficient: shift focus to systemic views.**
- **Mining can alter significantly water quantity and quality in a context of global change, but we can't change what we are not measuring systematically.**



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***THANK YOU!***

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