

Comparing Red-Spotted Toad Presence from 1960 to 2021

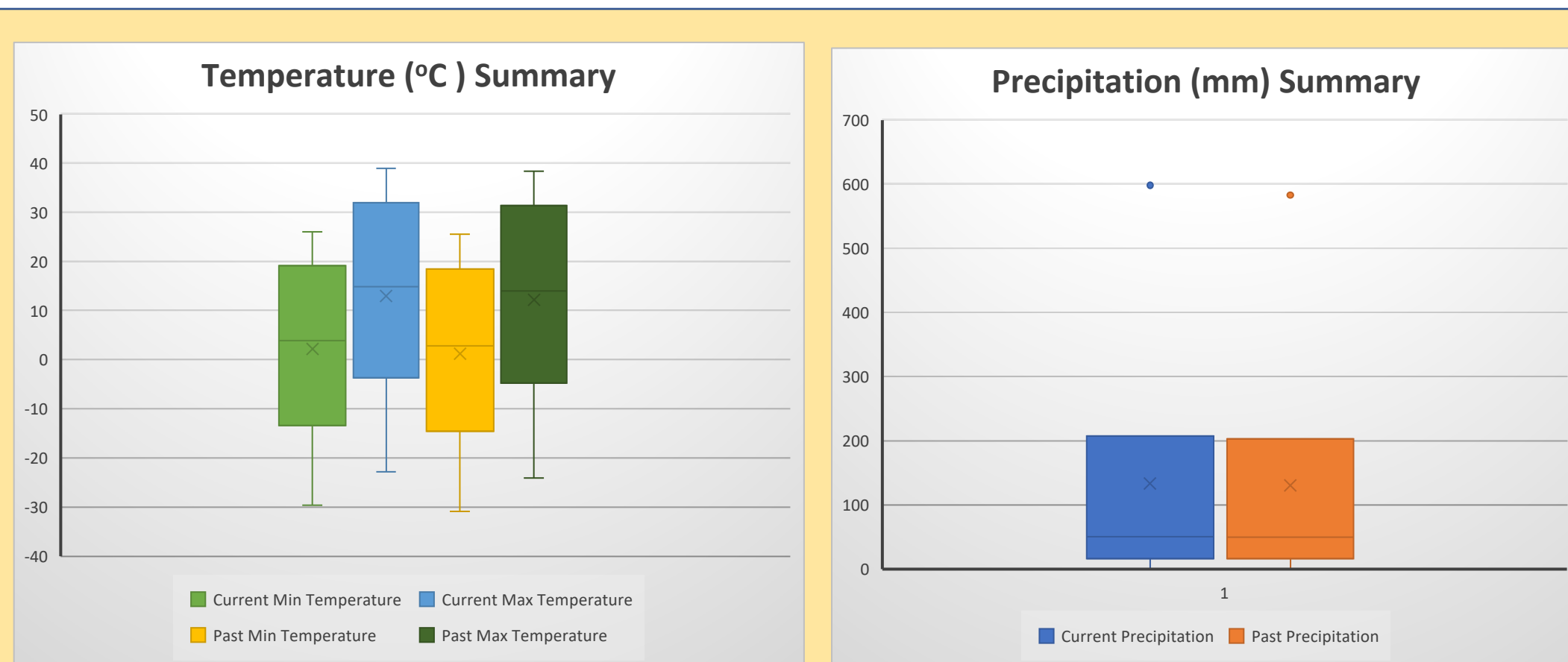
Introduction and Objectives

- Amphibians are widely underrepresented taxa in research efforts, and underrepresented in the global network of protected areas₆
- Amphibians are also experiencing global decline that has been linked to climate change and rising temperatures₁
- My goals were to investigate if there was an increase in temperature and decrease in precipitation between 1960 and 2021, and how has Red-Spotted Toad range changed from 1960-2021

Methods

- Red-Spotted Toad data was downloaded from gbif₄
- Environmental variables were downloaded from WorldClim historic monthly climate data₃
- Variables were separated into current and past cohorts based on year
 - 1960-1999 = past climate
 - 2000-2021 = current climate
- All data cleaning and variable manipulation was performed in R₇

Results



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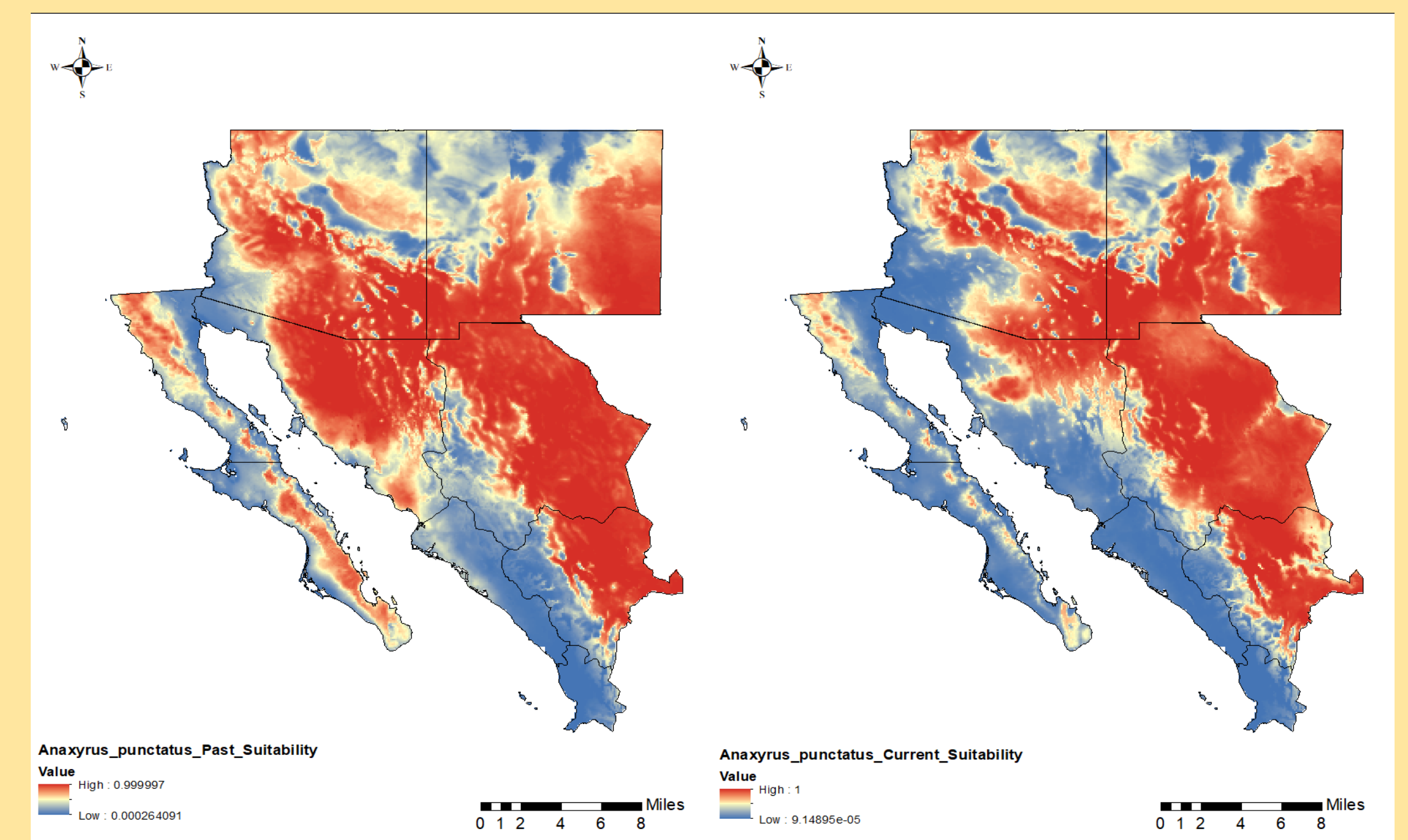
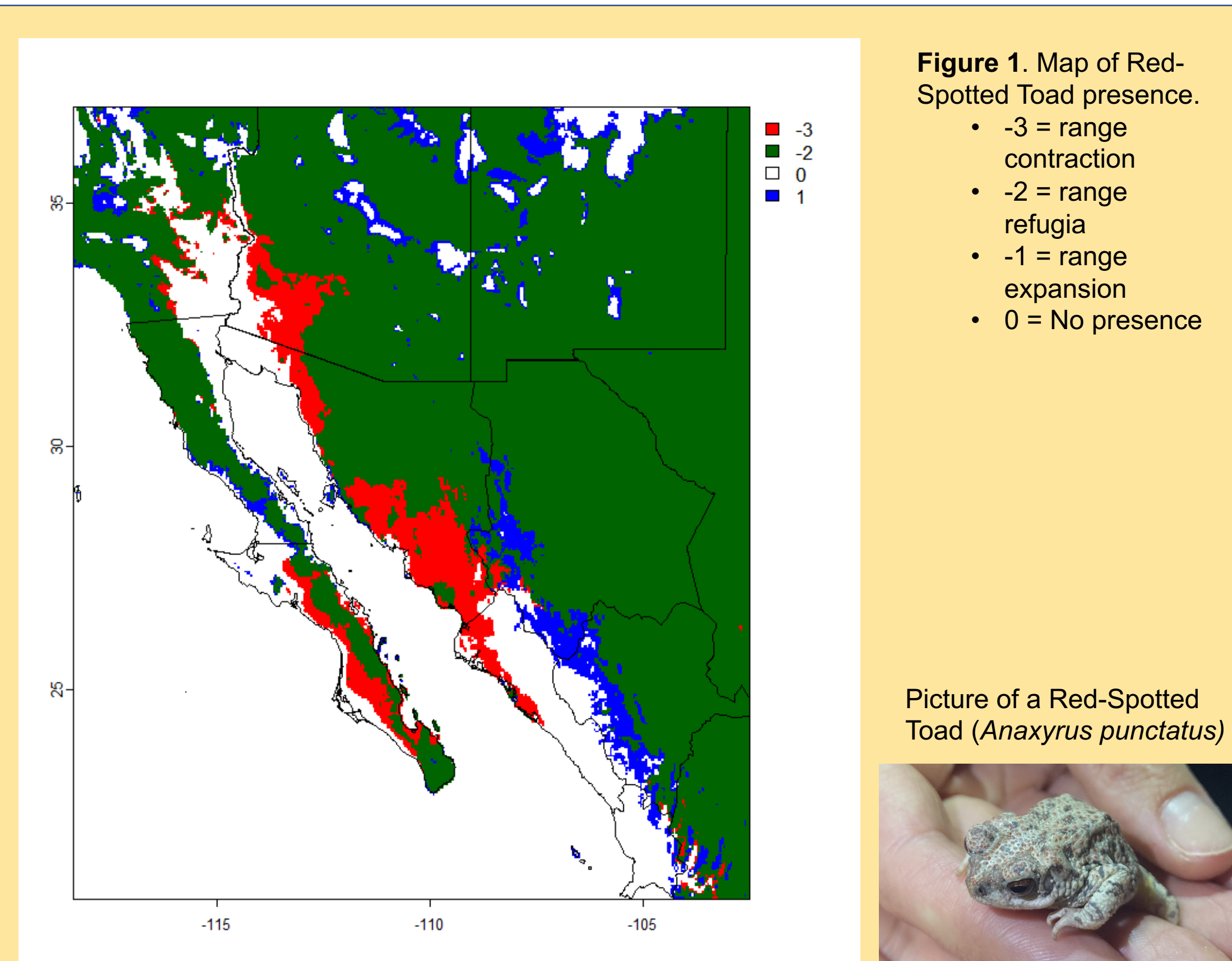


Figure 2. Past Suitability map for Red-Spotted Toad from 1960-1999 **Figure 3.** Current Suitability map for Red-Spotted Toad from 2000-2021

Results

- Results depicted minimal change in temperature values between the past and current climate.
- There was a range shift change identified between the past and current range for Red-Spotted Toad
- Significant range contraction was seen in southwestern Arizona, and along the southwest coast of Sonora, Mexico
- New range expansion was seen across multiple states in Mexico, and in northern Arizona and New Mexico

Conclusions

- The changes in temperature and precipitation were minimal and not significant to the model
- Other factors may be the cause of the range change such as habitat destruction, disease, invasive species, or human actions₅
- Red-Spotted Toad is currently listed as Least Concern for protection, but if it's range were to continue to shrink it could lead to complications for the species
- Amphibians are the most endangered class of vertebrates and climate change may exacerbate problems species may be already facing₂

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